Volume XXXIII MAY 15, 1905 Number 10

GLEANINGS IN BEE CULTURE

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THE A. I. ROOT CO.
MEDINA OHIO
U.S.A.

Western Edition

ENTERED AT THE POSTOFFICE, MEDINA, OHIO, AS SECOND-CLASS MATTER

GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

ILLUSTRATED SEMI-MONTHLY

Published by THE A. I. ROOT CO. $1.00 PER YEAR MEDINA, OHIO

Vol. XXXIII. MAY 15, 1905. No 10

J. D. BARFIELD, I wonder if you did not let that Danzenbaker hive stand in the hot sun, making three swarms desert it, page 490. Next time shade it some way, and be sure that, for the first two or three days, the cover fails by half an inch or an inch to cover the hive. [Good suggestions.—ED.]

GEO. M. PHIFER, when cleaning old frames to use again, especially to get the wax out of the grooves, uses a common putty-knife. Heat it over an ordinary lamp, and there you are. [The time taken necessary to heat the knife would make the operation slower than to use the cold knife all the time, it would seem to me.—ED.]

F. GREINER was, I think, the first to use the term "queenright." I had envied the Germans their word, "weiselrecht," but was not smart enough to use exactly the same term in English. Mr. Greiner was. "Queenright," Mr. Editor, means more than "a colony with a queen." A queenright colony is "a colony that has a queen that is all right."

ALLOW ME to suggest to E. Van Fradenburg, page 489, the very great advantage of having crowded entrances in pairs. It is equivalent to doubling the distances. Let each pair of entrances be close together, separated by only a little board between them, projecting outward; and, although the two entrances be only an inch apart, each bee will keep to its own side.

"WHY USE a dummy in eight-frame hives when none is needed in a ten-frame hive?" page 496. Begging your pardon, it was a mistake to make ten-framers without dummies. [You refer to statements made by members at the Michigan State convention. But a ten-frame hive with a dummy would only add an extra expense. I suppose the most of the ten-frame hives we sell are run for extracted. If you mean a thin *division-board*, we do supply them with both eight and ten frame hives—always have done so.—ED.]

A THIRD MORE extracted than comb, says a footnote, page 491. A half more might be nearer the truth; but I'm willing to arbitrate the question. [In any case, the proportion can be only a guess. I am willing to accept a half more; but an article by a correspondent two or three years ago (I think it was by R. C. Aikin) went to show, by some experiments made, that the difference was nearly as much as we had supposed. That was one reason why I put the average at a "third" rather than a "half" the usual rule.—ED.]

E. L. PRATT tells, in *American Bee-keeper*, about wintering queens successfully in the Swarthmore mating-boxes. He takes two or three cupfuls of young bees to a box, and on a warm day just before winter gives them two fat combs of honey, leaving them undisturbed till spring. "To prevent any possibility of the queens wandering away from the cluster, place a piece of queen-excluding metal over the flight-hole on the inside. A $\frac{3}{8}$-inch flight-hole is none too large for wintering queens in Swarthmore mating-boxes. [As I said in our last issue, that might do for a climate like that of Philadelphia, but I doubt very much whether it would do in one as cold as we have here at Medina, to say nothing of one still colder, like that of Marengo.—ED.]

"IF BEE-KEEPERS would use lots of printers' ink they would never need to worry as to the sale of honey," says R. L. Pennell, page 487. Quite right; and is there any better way to do it than through the Honey-producers' League? If every bee-keeper who takes GLEANINGS were to join the League, I wonder how much money it would allow to be used for printers' ink. Possibly the editor could give us a guess. [It is hard

to estimate on this, but the figure would not any be less than $25,000 if every one of our subscribers would give his pro-rata share toward the Honey-producers' League. My first rough estimate was over $50,000, which figure I cut square in two. So far manufacturers of bee-keepers' supplies have pretty generally contributed toward the fund.—ED.]

A. I. ROOT wants "something more about the wintergreen." In Pennsylvania it is common in the mountains. I never saw it on low ground; but it likes the very loose rich soil well covered with leaves. A favorite place is under shelter of laurel bushes, and it is an easy thing for the novice to mistake young laurel seedlings for wintergreen. But a taste quickly undeceives him. It is called also mountain tea, checkerberry, and sometimes partridgeberry. But the true partridgeberry (*Mitchella repens*), although bearing some resemblance to wintergreen (*Gaultheria procumbens*), is a different affair; and with its double, scarlet, insipid berries is much more beautiful. If an ornamental plant is what you're after, Bro. Root, better turn your attention to the partridgeberry rather than wintergreen.

"IN SOME CASES six weeks will be too short, and in other cases five would be too long a period" for the life of a worker-bee, page 465. Sure, but that's aside from the question, "What is the average?" If the common teaching is wrong, the sooner it is righted the better. But there has been some proof offered that six weeks is the average life of a worker. If that's to be changed to five, surely we should have some reason for the change. If Clericus is right, give us the proof, Mr. Editor, but please don't becloud the issue by irrelevant statements that no one thinks of disputing. [The conditions are so extremely various that I am not sure but five weeks would be as good an average as six. The actual difference is only small. It might be better still not to make a definite statement, but say from four to eight weeks. In other words it seems to me it would be hard to indicate an average reduced to so many weeks.—ED.]

LOUIS H. SCHOLL, page 468, thinks that foul brood across the water may "be of a milder form than the dreaded disease we have in America." *Bacillus alvei* ought to be the same everywhere, but some have suggested that, where the disease has been longer in existence, the bees have become more immune to it. [There are others who share the same opinion as Mr. Scholl, or at least have expressed themselves in these columns. *Bacillus alvei* will be the same everywhere; but the same microbe, under different conditions, might be much more destructive than under others. Is it not impossible that *Bacillus alvei* could be less destructive in Europe because of the environment than the same germs in this country? However, I share your opinion that the disease is probably more destructive in this country because the average locality is less familiar with it than in Europe.—ED.]

OPINIONS harmonized while you wait. Page 291, under "Winter Flights. . . Opinions Harmonized," you speak, Mr. Editor, as if you had never advocated "leaving the bees out several days or a week" for a midwinter flight. A Wisconsin friend, who has been looking up your past record, refers me to GLEANINGS, 1902, page 371, where you tell about brood being started by midwinter flight, and claim it as a point in favor of giving the bees a *week's* flight in February or March. Evidently in such a progressive thing as bee-keeping it will not do to be too reckless as to what one has or has not said in the past. [But, hold on, doctor, you and the Wisconsin man are reading more into the language than there is actually there. Turn again to the first reference, 291, and the very first sentence reads, "I am not sure there is any thing in the articles in this issue, on the subject above, that is not in harmony with what I have advocated in reference to these winter flights." Note I said "not sure." Nothing "reckless" or overpositive in this statement, surely, for that qualifies all the rest of the editorial. In the second paragraph of the same article, I gave, perhaps, the impression that I never advocated putting the bees out for several days or a week, but I did not make a declaration to that effect. But suppose I did. The second quotation, page 371, 1902, does not advocate any thing, but simply states what we did, without a recommendation. The article in question was on the general subject as to whether it was best to give midwinter flights, and then I went on to detail some experiments. The first lot of bees were left out for nearly a week, with the result that brood-rearing started. That was mentioned only incidentally, but this long stay was not "advocated" in that article; and the nearest endorsement I gave to it was this: That there was one point in favor of giving the bees a week's flight—the starting of brood-rearing. It so happened that spring favored the keeping of the bees before returning, longer than usual; but our rule has been one or two days, without brood being started.—ED.]

WINTERING BEES in a cellar with a furnace. The experience of the first two winters made me feel that, however good a furnace was for the people above, it was a bad thing for the little people down cellar. The first winter was not a fair test, work at putting in furnace preventing the bees from going in at the proper time. But there was no such excuse for the second winter, and I lost heavily, partly through starving in cellar, and partly from being taken out too early so as to feed them. It began to get into my head that, with the thermometer generally ranging from 50 to 60, bees would use up a lot more food. So I aimed to have a heavier supply for last winter. Yet one starved in cellar, and, I am ashamed to say, one starved after being taken out. That was the only winter or spring loss, except those I broke up because of queenlessness

or bad queens. On the whole I am inclined to the opinion that the furnace is a good thing for the bees. The chief objection is that they need as much food as if wintered out. But practically it makes a mild winter for them, the cellar being kept so open most of the time that the air was as pure, almost, as outdoors; no appearance of diarrhea except in a very few hives, and, strange to say, the fronts of those few hives were very badly daubed. But inside the hives it was clean and sweet, and the bees showed no appearance of having suffered. It rather looks as if the warm temperature allowed the bees to go outside, empty themselves, and then go back into the hive in a more comfortable frame of mind. If future winters turn out the same, the furnace will be a good thing. [An ordinary bee-cellar with a furnace affords almost precisely the same conditions that we have in our machine-shop cellar, where we have scored such splendid results in wintering. Notwithstanding some experiments that were made some years ago, showing that dampness was not detrimental to bees in a cellar, I am satisfied that dryness and a temperature of 45 or a little above, with a large amount of ventilation, are very important essentials. At two of our outyard cellars we have dampness, even to the extent of mud, in one of the cellars. The mortality was heavy in both. Now, then, with a furnace in the cellar we can have plenty of ventilation, perfect dryness, and a better control of the temperature. If the temperature gets too high, opening the windows will bring it down, and at the same time supply the essential ventilation. If I mistake not, doctor, you wintered your bees last winter the best you ever did, because you had perfect dryness, and because you gave a large amount of ventilation. We are beginning to learn something on this wintering question.—ED.]

BE A BOOSTER.

Join the Honey-producers' League, and lend your money and your influence to the first organized effort to improve the condition of the honey market by the use of modern business methods. Your help is needed. Lay aside your selfishness, and do not be afraid to help yourself, because in so doing you may help others.

GIVING BROOD TO FORCED SWARMS.

Opinions differ as to whether it is advisable to give a frame of brood to a newly hived swarm. My experience is that a shaken swarm to which a frame of brood has been given is much more apt to swarm out than one hived in an empty brood-chamber—this when they are hived in one section of my hive, equal to about five L. frames.

R. C. AIKIN AS EDITOR.

The bee department of the average agricultural journal is usually not much credit to anybody; but one of the brilliant exceptions to the rule is that of *Irrigation*, which has been selected as the official organ of the Colorado State Bee-keepers' Association. With our old friend R. C. Aikin, secretary of the aforesaid association, in charge, it is destined to be both reliable and interesting.

LEGISLATION AGAINST SWEET CLOVER.

Some misguided individual introduced a bill during the last session of the Colorado legislature, declaring sweet clover a noxious weed, and requiring its cutting before coming into bloom, under penalty of a heavy fine. Fortunately the bee-keepers had some good friends in the legislature, with saner ideas on the subject of weeds, and the bill was effectually killed in committee.

SOLAR EXTRACTORS.

Have you a good solar wax-extractor? If not, better buy or make one. There is no other way by which as nice wax can be made with as little labor as by the use of a good solar, properly managed. Solars can not handle old dry brood-combs profitably; but for all other kinds of wax refuse they are ahead of any other process. There is some wax left in the refuse from a solar. To get this out profitably you need some kind of pressure combined with boiling or steaming. If you own more than a few colonies you can profitably own both a solar and a wax-press.

HELPING WEAK COLONIES.

Many bee-keepers consider it the proper thing to help along and build up weak and queenless colonies found early in the spring by giving them frames of brood and bees from stronger colonies. Better not. The queenless colony at this season of the year is usually worthless, and the weak colony had better be left to its own devices until later. The frame of brood you would give to it is worth more in the colony from which you would take it. If a colony is strong enough to spare profitably a frame of brood, better give it to a colony of medium strength than a weak one. Remember the harvest depends on the number of bees at work, not on the number of hives with bees in them.

VETO OF MISSOURI'S FOUL-BROOD BILL.

It must be conceded that Governor Folk, of Missouri, is an able man. His record in fighting corruption in that State, rewarded by his practical indorsement by both par-

ties, and his election in spite of opposing political conditions, prove this. His veto of the foul-brood bill which recently passed both Houses of the legislature must not be laid so much to narrowness on his part as to the fact that even good men are not always able to see all sides of a subject with which they are unfamiliar. Doubtless before another foul-brood bill is brought to him for his signature the bee-keepers of Missouri will see to it that he has a chance to receive some elementary instruction on the subject of contagious diseases.

LITERATURE IN SHIPPING-CASES.

When I wrote the article on p. 357 I had no idea of being thought original in advocating sending out leaflets with each case of honey. This has already been done by others, and advocated in the bee journals at various times. I really supposed, though, that I was the first one to think of using a printed poster in place of the ordinary plain cover-sheet. Only a few days after I wrote it, however, while overhauling some old journals I accidentally came across the following, read by Irving Kenyon at the Onondaga Co., N. Y., convention: "I think it would be a good plan to lay a paper large enough to cover the sections in each shipping-case, and print on it, with red ink, and with type large enough to be read without glasses, '*Please keep this honey dry and warm. Don't store in a cellar, meat market, ice-chest, or cold storage.*'" I presume I read this at the time it was published, but entirely forgot it until the present condition of the honey market revived the idea in my mind.

WHAT SHALL THE HARVEST BE?

In attempting to forecast the honey-yield for the coming season, two guesses make themselves prominent. One is that there will be a great deal of swarming in this valley. This is based on the fact that the unusual amount of snow and rain during the past winter and spring is producing an unusual number of wild flowers, especially the yellow cleome (*Cleome lutens*), which is now springing up thick all over the desert, which ordinarily has no honey-yielding flora. This blooms at a time when there is ordinarily a dearth of honey-plants, keeping brood-rearing stimulated to the utmost during May, and bringing the bees into the beginning of the flow from alfalfa strong in numbers, and with their hives already well stored. Similar conditions two years ago produced an extraordinary amount of swarming; and the probabilities are that this will be duplicated the coming season. The other guess is that there will be an unusual number of grasshoppers this year. They were very abundant last year, and did considerable damage to the honey crop in this locality by eating the blossoms of the alfalfa. The myriads of eggs they laid in the fall may hatch into a devastating horde for this season. If so it will not be the first time the honey crop here has been ruined by grasshoppers.

WEIGHT OF SECTIONS.

The fact was brought out at the River Falls, Wisconsin, convention that one of the members whose honey weighed 26 lbs. to a 24-section case had to submit to a cut of 1½ cents per lb. on that account. This accords with what some of our honey-merchants have told us before. People will pay 16 cts. for a 16-ounce section. They will willingly pay 14 cts. for a 14-ounce section. They will gladly give up 12 cts. for a 12-ounce section; but somehow when they are asked to pay 18 cts. for a section that weighs 18 ounces many of them will look askance, and conclude that the price is too high. At the root of this is undoubtedly the deplorable idea that a section of honey weighs a pound. I think it is unfortunate for the honey-producer that this idea ever gained currency. It is impracticable and impossible to secure any thing like absolute uniformity in the weight of sections; and the nearer they approach a pound in average weight the greater will be the variation in individual weights. This is especially the case when separators are not used. The pound-section idea is a delusion and a snare. If you want to please the dealer and satisfy the consumer, turn your attention to the production of sections as uniform in weight as possible, so that, when sold by the piece (as they will be anyhow), no injustice will be done to anybody.

FOUL BROOD.

After making due allowance for the fact that foul brood may be cured in a variety of ways by the expert, and with but little risk of spreading the disease in so doing, the fact remains that, for the average bee-keeper, the easiest, quickest, surest, and (four times out of five) the cheapest way to get rid of foul brood is to burn up all infected colonies, bees, combs, and hives, just as soon as it is discovered. The attempt to cure it or to save hives or honey, or to put off dealing with it till a more convenient season, usually results in spreading the disease. The infected colonies which he intended to treat at once are left until some of them become weak and are robbed; the bees find their way into the hive which he closed up so carefully, or into the building which he was sure was bee-tight. Some have felt sure that the nice combs of honey at the sides of the hive could not have any thing wrong with them, so they fed them to colonies that were short of stores, with the usual result. Some could not bear to destroy such nice honey; and as they could not well use it themselves they gave it to their neighbor. The neighbor's wife cut the honey out of the frames, and, in the kindness of her heart, threw the frames out on the woodpile for the bees to clean up. Perhaps the bee-keeper moves the infected hive to another part of the apiary, where he thinks he can treat it more safely, and the return-

ing bees enter the neighboring hives. While this will not always convey the disease, it certainly does sometimes. Or he shakes the bees off the infected combs at an improper time or in a wrong way, so that the bees scatter into all the neighboring hives, making one case of the disease into several. One man shook the bees of a diseased colony after all the bees had stopped flying, and then went to supper, leaving the infected combs exposed. When he returned, half an hour afterward, the air was full of bees from half a dozen colonies that were busily engaged taking care of the unexpected find. These things are not confined to the inexperienced keeper of only a few colonies. They are sometimes met in the bee-keeper of many colonies and years of experience. In fact, the beginner anxious to learn is often more successful with foul brood than one whose years of experience have made him careless, or who thinks he knows it all.

Our acknowledgments are due the *American Bee Journal* for a fine write-up, in the May 4th issue, of The A. I. Root Co. There appears on the front page a view of The A. I. Root Co.'s buildings, and portraits of the active men in the company itself. These half-tones appeared originally in White's *Class Advertising*, a beautiful monthly magazine devoted strictly to agricultural advertising, of the clean sort, and our thanks are extended to that publication also.

We have been having alternately hot and chilly weather, with much cold rain, this spring. We observed that the small baby nuclei are standing these extremes even better than the old-fashioned Langstroth-sized two-frame nuclei. The bees can keep a small cubical space warm much more readily than a flat oblong room with a great deal of surface exposed to the weather. Two hundred bees will keep warm better in the former than 500 or 1000 will in the latter. Another thing, we observe the bees in the baby boxes with the small entrances seem to resist robbers better.

HATCHING EGGS OVER A BEE-HIVE.

On page 324 I told you I had written Mr. Decker in regard to his success which has been so widely paraded through the papers; but up to date he has made no reply whatever, although I sent him a copy of our journal, and asked him to tell us whether he authorized the extravagant claim made through the papers, purporting to come from him. I learn from bee-keepers in his vicinity that he is considered to be a reliable man. From the fact that not one report has come from any of our readers, of successful hatching of eggs over a bee-hive, we must conclude that Mr. Decker has either found out that he made a mistake or else in his enthusiasm he was led to exaggerate. Incubator men agree that eggs must be kept at 102, or, still better, 103; but you will notice by referring to page 368 that the temperature in the warmest part of the hive does not exceed 98 right in the center of the brood-nest. During the hottest summer weather the experiment might succeed, but I do not think it can compare with an incubator, either in the expense of running or making a succesful hatch.

Here is another.

> Here is a clipping which I cut from the Indianapolis *Sentinel*. You may find out whether there is any truth in it or not. I tried the same some years ago, and failed, and think this is a hoax. T. McManus.
> Rushville, Ind , Apr. 29.

We learn from the clipping inclosed with the above letter that Mr. Decker is 70 years old, and has been working with bees and poultry all his life; and it also contains the oft-repeated story that eggs over a hive will hatch in 19 days, while 21 are required with a hen or incubator. The clipping winds up with the following remarkable statement:

> The claim is made that one hive in this manner may be made to do the work of eight sitting hens, and at the same time yield 100 pounds of honey in one season.

A. I. R.

SHAKEN OR BRUSHED SWARMS; A COUPLE OF POINTS TO REMEMBER.

A year ago when this question was discussed, and a great many tried the method, there were some who failed. An examination into the conditions in such cases showed that the bees had been shaken when there was no indication or desire on their part to swarm. A general "shake-up," and putting into entirely different quarters, caused trouble, with the result that the bees so treated swarmed out, defeating the very object of the anticipatory swarming, for this is really what brushed swarming is. I think it is pretty generally agreed that there should be swarming-cells with eggs or larvæ, showing unmistakably a desire to cast a swarm in the very near future. Not until then should shaking be undertaken.

Another factor contributing toward failure on the part of a few was shaking on to drawn combs or full sheets of foundation. While some have practiced the method successfully, shaking on to either, the majority seem to be of the opinion that only foundation starters should be given in the brood-nest. The forced swarm will then immediately occupy the super or partly drawn sections, which will, of course, be placed on top of the swarm, and in the mean time gradually draw out the starters below for the occupancy of the queen. Some give a frame of unsealed brood with the other frames of starters in the new hive set on the old stand.

Perhaps some of our new subscribers will feel interested to know to what the forego-

ing has reference. "Shook swarming," as it is generally called, briefly described, is this: Just a few days before a colony is about to cast a swarm, or is seen to show indications of such desire, the old hive, with the super, is moved to one side a few feet, entrance pointing in the same direction, and a new hive with frames of starters is put on the old stand. Three-fourths of the bees in the old hive are shaken or brushed off the combs in front of the new hive now on the old location. Last of all, the super on the old hive is put on the new one. In two or three weeks more, when the brood is all hatched in the old hive, the combs may be given another shake, giving the swarm the rest of the bees it would have had provided it could have been induced to remain contentedly in the old hive. The queen, virgin or laying, in the old hive should be removed before the second shake.

This method of swarming makes it possible for the apiarist to force the probably inevitable swarming to a time when he can take care of the bees. If the colony was left to itself the swarming probably would take place when he was away or when it would not be convenient.

SLIP-GEAR HONEY-EXTRACTORS.

BICYCLES having a clutch by which the propelling crank can be instantly and easily thrown out of gear, leaving the cranks at rest while the machine is in motion, have come to be quite common. After riding one of these machines it occurred to me that the same principle might be applied to the propelling crank of an ordinary honey-extractor. An experimental machine or two were made, and so constructed that the large gear-wheel could be instantly thrown out of mesh with the small pinion on top of the perpendicular shaft. This permitted of getting the extractor up to a high rate of speed, loaded with combs, when, by the touch of a button, the horizontal shaft and crank with its large gear-wheel would be instantly thrown out, allowing the reel to revolve noiselessly, and without the grinding dragging friction of the unequally balanced crank-shaft and gear-wheel. The result was that the baskets would revolve much longer, permitting the acquired momentum to throw out some of the still clinging residue of honey, just at the moment when the application of power was released.

About this time one of our subscribers accomplished the same result by knocking out a few teeth from the large gear-wheel. I do not recall his name now. At any rate, he wrote us, explaining his ideas. At first thought it seemed impossible that any thing like this could work; but, to our surprise, it did work. But it is easy to see that, in the hands of the average person, the gears might ride on top of each other, resulting in a breakdown.

About this time, also, we heard that Mr. James Heddon was making use of a slip gear and an improvised brake. The Heddon-Cowan extractor is shown in the *Bee-keepers' Review* for April 15. The principle of the Heddon slip gear is practically the same as ours, and, as nearly as we can discover from the picture and illustration, far better than the knocked-out-teeth principle.

The Heddon principle, as well as the one we use ourselves, allows the horizontal shaft with its large gear-wheel to be drawn away from the pinion on the perpendicular shaft just far enough to let the gears out of mesh. We used a metal fork, the same as Mr. Heddon, the same straddling over the shaft between the center bearing and the large gear-wheel hub. In order to get sufficient room for this, this hub was cut off, in our case, about ¼ inch so as to allow a fork (¼ inch thick) to slip in between the bearing and the hub of the wheel. When the fork was pushed into place the gearing would be in mesh. Pressure on a lever would lift the fork up, when a spiral spring would automatically crowd the horizontal shaft endwise just far enough to throw the gears out of connection.

The same principle can be applied to extractors already in use, or almost any of the Cowan and Novice construction. All that is necessary is to take off the large gear-wheel on the end of the horizontal shaft; cut or grind off one-fourth of the hub. Get your blacksmith to make a fork that will straddle the shaft in the space between the upright bar and the space now made vacant by reason of the hub having been cut away.

If there were any demand for slip gearing the Root Co. could, no doubt, make the necessary arrangements to put this feature on the market as an option for those desiring it.

THE A. I. ROOT CO. IN THE BEE-BUSINESS.

SOMETIMES when I attend conventions bee-keepers ask me how many colonies we have. I tell them, much to their surprise, that I do not know. A three or four frame nucleus I would hardly count as a colony. If I told how many hives we had with bees in, that would still be an unfair comparison when contrasted with the number of colonies owned by a honey-producer who runs for honey only. We have several queen-rearing yards and several honey-yards, the total number aggregating eleven in all. Two of these apiaries are in Cuba, two in New Jersey, one in Pennsylvania, one near New York, and five within five or ten miles of Medina; and the total number of colonies, or, rather, hives with bees in, not including baby nuclei, for they do not count, is approximately 900.

On page 535 of this issue we give a view of one of our New Jersey apiaries located at Salem, from which we supply bees and queens for part of our Eastern trade. The high board fence makes an ideal windbreak. Then there is a tool or smoker box right close to the gate, the convenience of which can readily be appreciated.

We have another yard at Jenkintown, Pa., and still another at Mattawan, N. J., and

one near the city of New York, as already stated. We shall be glad to have our bee-keeping friends call at any of the yards; if they desire to see practical demonstrations, be free to ask for them. But before visiting any yard make arrangements in advance with either the New York or Philadelphia office—the former at 44 Vesey St., and the latter at 10 Vine St. There might be days when there would be no one in charge, hence the advisability of writing to either of the offices in advance.

Of course we are always glad to see visitors at any of our Medina yards, and our bee-keeping friends from near and far are invited to come and see us and look over the work that is going on. Queen-rearing will be under full pressure *a la* Swarthmore about the time this journal reaches our readers. The demand for bees is getting to be quite extensive. From our home yard and the basswood apiary we have made a good many shipments of bees and queens, and shall be sending out every day.

It has always seemed strange to me that there were not more bee-keepers who were willing to sell bees. In looking through the poultry journals I notice that nearly every breeder and fancier has eggs or trios to sell. There is good money in selling bees early in the spring, and our friends are invited to investigate this one department of the bee-business.

THE FIRST-PRIZE PHOTO OF AN APIARY, SEE PAGE 537.

In our issue for March 1, under the head of Special Notices we announced that we were in need of certain photos relating to bees, and that we would award certain prizes for the best pictures.

In response to this we received a number of fine and interesting pictures. A committee from our office was selected to classify the pictures and award the prizes according to their merit. The scoring-points were to consist of clearness and artistic beauty as well as something interesting and instructive for every-day practical work. The committee knew none of the bee-keepers who sent the photos in, and awarded the prizes solely on the scoring-points above named.

The first prize for a view of a bee-yard was won by Ernest W. Fox, of Hillsboro, Wis., and the picture is reproduced on page 537. Whether E. W. Fox is related to Elias Fox, of the same place, so well known to the bee-journal readers, I can not say.

In the prize-winning picture there is a fine blend of high-light and shadow, or what an artist calls "atmosphere"—in short, nature as it is, and not as it would be after man has made it over according to his ideas of landscape effect.

We received other photos showing the hives arranged with geometrical regularity, and grass mown down as in a park; but this picture combines a beautiful touch of nature just as she is, with the practical every-day affairs of life. The background of the woods is suggestive of coolness, peace, rest, and quiet. The ferns in the foreground, with the leafy stillness, combine to set off the view as in a wreath.

As to the practical part of the picture, the location is ideal in that it is a side-hill. The winter repository on the right is reached by an easy grade of path that permits the loads of combs to be run down hill and extracted and brought back empty, and put on the hives again; and when winter finally comes on, the hives can be carried down hill toward the cellar and then put back on their summer-stands in the spring a good many pounds lighter. The side-hill cellar offers the advantage in that it makes it possible to enter the bee-cellar without going down steep steps as into a cistern, as it were. As those know who have tried it, carrying heavy colonies up and down steps into and out of a dark cellar is not an easy job.

But the picture suggests another feature, and that is the two solid windbreaks on one side and on one end. The yard is probably not entirely closed with woods, else there would not be the need of the stones on the hive-covers. (By the way, the stones are the only things that mar the picture.) The tent on the left is strongly suggestive of outdoor air and good appetites—two things that help make life enjoyable. The medical fraternity has just begun to discover that tent life is the best cure for diseases hitherto regarded as incurable. What is good for a sick man must indeed be invigorating to a well one.

The hives tiered up two and three stories high, the kegs or barrels of honey, the honey-extractor, all betoken prosperity. It is, therefore, fortunate that the picture was taken when the yard was wreathed out in all its glory.

This is the first of the series of prize pictures that will be presented, and others will follow from time to time.

Below we give the list of the successful prize-winners. There are some other excellent pictures that did not win any prizes that we shall be able to use, and will pay for according to their merit.

The object of this prize contest was to secure certain pictures for our industrial publications on bees.

For best photo of apiary:
1st prize.—Ernest W. Fox. Hillsboro, Vernon Co., Wis.
2d prize.—Chas. Macklin, Morrison, Whiteside Co., Ills.
3d prize.—Adam A. Clarke, LeMars, Iowa.

For best photo of any other object interesting to bee-keepers:
1st prize (swarm).—A. L. Errett, Madison, Westmoreland Co., Pa.
2d prize (swarm).—W. C. Naftel, Naftel, Montgomery Co., Ala.
3d prize (bee-tree).—Geo. A. Fenton, Mazeppa, Wabasha Co., Minn.

"THE SENATE PLOT AGAINST PURE FOOD."

In the *World's Work*, a beautifully illustrated and ably edited magazine, published by Doubleday, Page & Co., New York, appears an article by Edward Lowry, with the foregoing heading. It would appear from this article that the interests of the people—those who are and should be most vitally

interested in national pure-food legislation—have been most shamefully ignored, and that "special interests," such as the whisky traffic, the glucose, pickle, ketchup, canning, and patent-medicine lines of business have had most careful consideration from the dignified Senators. Pure-food legislation has been up in our national Congress for upward of twenty years; but in each and every case it has been blocked in the Senate for some unexplainable reason. The various bills are allowed to pass the House; but when they come up before the upper House they have generally been killed in committee because some special interest would suffer. Mr. Lowry says, "It is difficult to assign reasons why some of these men [referring to the Senators] have opposed a measure which every one, except those to be punished, acknowledge to be both desirable and necessary."

One slogan of the opposition is this: "If you undertake to make all people perfectly honest in their dealings, you have a very large job on your hands," which practically means, if you can't help yourself sit down and be imposed upon all your natural life. Then the opposition defends the "misbranding and the adulteration of foods with so-called harmless substitutes on the ground that it puts certain products which, in their pure state, are dear, within the reach of the poor man." But, *does* it? If that same poor man could know that he was paying two or three prices for an abominable substitute under a misbranded name, *before* paying down his hard-earned money, would he do it? The statement is made, too, that, unless preservatives can be used, many valuable food products would go to waste which might otherwise be made available for human consumption. If it can be proven that these preservatives are harmless—absolutely so (something that has never yet been done, and probably never will be), then there might be some show of reason in this line of argument.

Mr. Lowry's article all through comes down heavily on the United States Senate, and singles out certain ones of the Senators representing some of our great commonwealths who have stood out persistently against any legislation of this character; very fortunately, this question of pure-food legislation is like Banquo's ghost—it will not down. The people are getting stirred up, and some day they will have a reckoning with some of these Senators unless they withdraw their opposition. But in spite of all this comes the encouraging news that three-fourths of the States of this Union have passed pure-food laws. The "special interests" are already beginning to squirm. They are beginning to see the beginning of the end.

Just now we need a national pure-food law that will prevent the importation of misbranded and adulterated foods from one State into another. When that is done, and the other fourth of the States without pure-food laws are protected, the bee-keepers of the country will see a decided change for the better. When the general public can *know to a certainty* that honey labeled as such in the bottle and in the section is absolutely pure and genuine (because it would be impossible for any thing else to be sold), then we may expect the business of the bee-keeper, and all other producers of pure food as well, to be much more profitable than now.

THE NEW HONEY-PRODUCERS' LEAGUE.

WHILE some have felt that there was undue haste in the organization of this new movement for the bettering of prices on honey (and to an outsider it *looks* that way), yet the conditions were such that there was not time to do any thing but to start *something* going, and that instanter, then later on make the necesary modifications after a little trial experience had shown what was wisest and best.* The criticism has been made, also, that the new movement ought to have been under the auspices of the National Bee-keepers' Association. But the promoters of the League, who gave this particular thought, say that the constitution of the National as it now exists would not permit of so large a call for funds. However this may be, it is not time to swap horses in the middle of the stream, or, to vary the figure, discuss whether we ought to have ridden this horse or that.

While I had nothing to do with the organization of the new movement, I felt that, though it did not suit me exactly in some respects, it was good enough to push forward, and then later on rectify whatever might not be to our liking.

Referring to the National, I see nothing in the way of having the League amalgamated with the old organization. This might be discussed at the coming meeting at San Antonio, and a committee be appointed to perfect a plan of union which could be ratified as soon as the necessary change could be made in the constitution. The new National then might have two departments—one of publicity and of education, as now undertaken by the League; the other to continue on with the present work already carried on by the National Association as now organized.

At all events, brethren, let us get together and push *both* organizations; and if it seems wise to amalgamate them, do so at the proper time later on. But let us be doing *something*. I have talked with one or two officers of the League in regard to this possible amalgamation, and they see no difficulty in the way.

Already the League has been doing some splendid work, the details of which it is, perhaps, not wise to make public at this time.

* Perhaps it ought to be said that it would be simply impossible to project an entirely new organization to do *new* work, and have it perfect at the start, even if months and months were taken. Better a *working* something, even if a little crude, which can be reorganized after a little *experience* has shown what can and what can not be done.

HONEY CONSUMED BY A COLONY OF BEES IN ONE YEAR.

Some Interesting Data Collected to Go to Show that the Amount may Run from 200 to 250 lbs.; a Valuable Article.

BY ADRIAN GETAZ.

Some time ago I made the statement that a good colony of bees must consume for all purposes about 200 lbs. of honey every year. Proof was called for, and the statement variously commented upon, most of the writers thinking the figures too high. As a matter of fact they were based upon the amount of honey lost (or, rather, used) by the bees during the feeding-back process.

It is needless to say that this amount consumed must vary exceedingly, according to the strength of the colony, the amount of brood raised, the temperature, and a number of other conditions not necessary to mention.

If we look into the matter systematically we shall see that the amount consumed will be made of several parts—

1. To keep the bees alive.
2. To furnish the heat necessary to the welfare of the colony.
3. To secrete the wax.
4 To feed and raise the brood.

Let us examine them separately.

KEEPING THE BEES ALIVE.

How much does it take to keep the bees alive? I know of but two experiments that can throw any light on this question. The first is by Mr. Dumont, in *L'Apiculteur*, Nov., 1902, pages 65–69 of the Report of the Federation of the French Societies of Apiculture. Without going into details, the experiment shows that bees kept in a room at the ordinary temperature consume each 0.0097 gram of honey every day. (One American pound equals 452 grams.) The average weight of each bee was found to be 0.0988. It follows from that, that the bees not working consume daily about one-tenth of their weight of honey merely to keep alive. That would be nearly a pound for a colony of 40,000 bees.

At first sight, that seems enormous; yet, after all, it is not. The stomach of a bee contains one-fifth of its weight of honey. One tenth is only half of it—we might say half of a "square meal." Surely a working bee should be allowed half a "square meal" a day.

The second experiment is from Mr. Sylviac (*L'Apiculteur*, Aug., 1903, pages 29–33 of the Report of the Federation of the French Societies of Apiculture). A nucleus (about ½ lb.) was wintered sucessfully out of doors —that is, in a "rucher," a bee-shed walled on three sides, open in the front. The nucleus lived through the winter, which happened to be very mild in that region. The honey consumed daily averaged 0.028 gram for each bee. That is enormous. This, if no mistake has occurred, can be accounted for by the fact that such a small number of bees could not keep themselves warm enough without the utmost efforts and the largest possible consumption of honey.

The question may be asked here, "If it takes that much honey to keep the bees merely alive, how can a colony go through the winter with only 10 lbs. of honey or less?" Well, I don't know. Perhaps they "hibernate" part of the time. I merely give you the facts as I find them.

The amount of honey consumed above the quantity necessary to keep alive in order to keep the brood and the interior of the hive sufficiently warm must be exceedingly variable—nothing at all in very warm weather, but possibly more than one imagines in unfavorable circumstances, such as during the early part of spring.

WAX-PRODUCTION.

This is another very variable quantity. If a swarm, natural or forced, has to build a full brood-nest, that means something like 3 or 4 lbs. of wax at least. In weighing the wax from full sections of honey I found one ounce of wax to each section. Somebody reported once only half an ounce; but, if I remember correctly, it was without the cappings. A surplus of four pounds of honey per day would mean the production of ¼ lb. of wax per day; and if it takes 4 lbs. of honey to produce 1 lb. of wax, we have right there a daily consumption of 2 lbs. of honey for wax purposes only, not speaking of what may be needed in the brood-nest for capping brood, etc. But how many pounds of honey does it take to make a pound of wax? The experiments of Huber, and, later, of Dumas and Milne-Edwards, can not be considered. Huber wanted to prove, and did prove, that the wax is produced by the bees, and not gathered from the flowers. Dumas and Milne-Edwards wanted to prove, and did prove, that the wax, like all the other animal fats and similar products, is due to a transformation of the carbo-hydrates consumed. That term, carbo-hydrates, includes sugars, honey, starch, and other similar substances.

So far as the relation between the honey consumed and the wax produced is concerned, those experiments, as well as others similarly conducted, are worthless. The quantity of honey reported includes what the bees consumed merely to live. There were too few bees, and, therefore, they must have consumed a large portion of the honey given to keep up the necessary temperature for wax-producing and comb-building. Huber reported only the amount of comb built, and kept no account of the scales that might have been on the bee's body. Dumas and

Milne-Edwards report the increase of fatty substances in the bodies of the bees analyzed. That should be added to the amount of comb built, since it is nothing but wax in course of formation. Each individual experiment lasted only a few days. Now, it is well known that the wax scales do not appear before the third or fourth day after the feeding has begun or the flow has opened. This should be taken in consideration.

Another way to get at it was undertaken and discussed some time ago by Messrs. Sylviac, Maujean, Devauchelle, and others, and reported in the *Apiculteur* and the *Revue Internationale* during 1901 and 1902. The principle is this: During the first two or three days after a swarm is hived, quite an amount of comb is built, but very few bees go to the field—that is, when neither built comb nor foundation is given. Assuming that the few bees that go to the field gather enough to keep the colony alive, knowing approximately how much honey a given swarm will carry, and taking for granted that this honey goes to the amount of wax produced, or an equivalent amount, the ratio between the two can be ascertained. I say the "equivalent amount" purposely. The bees of a swarm carry a certain amount of wax scales, and wax in course of formation in their wax-producing organs when they come out of the old hive. But this is offset by what scales and wax in course of production they may have at the end of the three days.

Quite a discussion took place in regard to the correctness of these assumptions, and what corrections should be introduced. The upshot of the whole thing was an estimate of from two to four pounds of honey for a pound of wax produced under such circumstances. That is a good way off from the twenty or thirty pounds estimated by some other processes.

During the discussion Mr. L. Maupy suggested that, chemically speaking, 100 grams of wax contain about 82 grams of carbon, 13 of hydrogen, and 5 of oxygen. On the other hand, 100 grams of honey contain about 8 grams of hydrogen, 64 of oxygen, and 28 of carbon. There is, however, quite a variation in the different qualities of honey. Anyhow, it is evident that, to furnish the 82 grams of carbon contained in 100 grams of wax, not less than 2½ or 3 times that amount of honey must be used.

I am inclined to think that, so far as the transformation of honey in wax is concerned, that is all that is needed. But there is the extra warmth needed to be considered. To make it plain, let us consider a colony having no super. All the warmth needed is enough to keep up the temperature of the brood-nest. But let us add a super. Then this super will have to be kept warm enough to insure a rapid production of wax and the building of the combs, and, of course, an extra quantity of honey will have to be consumed to that end.

Prof. Bruner, at the National Agricultural School of Cordoba (Argentina), has made a specialty of wax-production for several years. The wax there is worth 54 cts. per lb. Dark honey can be bought in unlimited quantities for 6 cts. per lb. Briefly speaking, the process is to feed the bees all they will take during the whole season, cutting out the combs from time to time, and melting them. The honey contained is returned to the bees. He says it takes 68 lbs. of honey to make 10 lbs. of wax. But, of course, this 68 lbs. includes all that the bees consume for living, brood-rearing, etc. To this 68 lbs. we should add what may be gathered in the field. If Prof. Bruner's bees behave like mine, that must be very little. With me, bees abundantly fed, and having to build their combs, abandon the field work almost entirely. For further details of Prof. Bruner's work, see the *Apiculteur*, Feb., 1904, page 55, and the *American Bee-keeper*, April, 1904, page 75.

BROOD-REARING.

Very little can be said on this subject. The Hon. R. L. Taylor said once in the *Bee-keepers' Review* that some experiments he made show that it takes 2 lbs. of honey to raise 1 lb. of brood; but he does not give any detail. It might be interesting to note here that the food given to the larvæ varies according to the age and sex, but contains between one-fourth and one-third of honey. If Mr. Taylor's assertion is correct, a colony raising 1000 bees a day would use ½ lb. of honey daily to feed them.

FEEDING BACK.

Perhaps the honey that the bees consume while they are "fed back" can give us the nearest estimate obtainable. This amount is exceedingly variable. In a bee-keepers' convention Dr. A. B. Mason said that he had tried once, and obtained more honey in the sections than he had fed. Very likely the brood-nest was full when he began feeding, and the bees removed some of it "up stairs" to make room for rearing brood, as they invariably start a considerable amount of brood when fed. At the other end of the line we find Niver, who says that he once fed 30 lbs. and got 3 sections for his feed and trouble, and then thought best to quit.

In the A B C of Bee Culture are found A. I. Root's experiments in the same line. He said that the bees when fed back always begin by cramming all they can in the brood-nest, often something like 25 lbs., but after that the loss is only one-tenth of the amount fed. He does not state how much was fed daily; but in the context he speaks of having feeders large enough to feed 15 or 20 lbs. a day. With 10 lbs. fed per day, the consumed honey would amount to one pound daily. I think it is more than one-tenth. I have had but little experience in feeding back, but I found out that, after first crowding the brood-nest, the bees take a portion of that honey in the supers, and start a considerable amount of brood.

The only carefully conducted experiments we have are those made by the Hon. R. L. Taylor. The first was made in 1893, when

589 lbs. of unfinished sections were put on; 789 lbs. of honey fed; 1051 lbs. taken off at the end. The increase of the weight of the hives was 59 lbs. There were 7 colonies rather weak since they had been reduced to one Heddon section. The experiment lasted four weeks, during which the weather was cool and rainy. Assuming that the increase of weight of the hives was altogether honey, and that nothing was brought from the field, we find a daily consumption of nearly 1⅓ lbs. per colony. See *Bee-keepers' Review*, Nov., 1893, page 309.

In 1894 the experiment was repeated on only two colonies; weight of sections given was 70 lbs.; amount fed, 219 lbs.; amount taken off, 205 lbs. The colonies were all weak. The experiment lasted, like the one of the previous year, four weeks. This shows a daily consumption of 1½ lbs., not taking into consideration what the bees may have brought from the field. The weight of the colonies is not given. See *Bee-keepers' Review*, Dec., 1894, page 321.

In the experiment of 1895, three colonies were used. Empty sections—that is, sections with only full sheets of foundation—were given. The food was sugar instead of honey. The colonies were two sections, Heddon, and therefore stronger than in the previous years. The experiment lasted four weeks and a half. The three colonies gave quite different results. Assuming that the increase of weight of hives was altogether honey, and that 4 lbs. of sugar equal 5 of honey, the three colonies consumed respectively 31, 38, and 84 lbs. of honey. Now, why such a difference? No robbing was observed. There was a honey-flow, and the colonies not fed gathered enough for winter, and some of them gathered some surplus besides. The three colonies fed brought in pollen regularly. If the difference is due to the fact that the two first colonies may have brought in enough from the field to make it up we are compelled to admit a consumption of about 2⅔ lbs. per day. Furthermore, the increase of weight of the colonies, 76 lbs. for the three, was likely due in part to an increase in brood. See *Bee-keepers' Review*, Jan., 1896, page 7.

The experiments of 1896 were conducted on four colonies. One received 225 lbs. of unfinished sections and 169 lbs. of feed; 318 lbs. were taken off, and the increase of honey in the brood-nest was 10 lbs. The experiment lasted from July 15 to Aug. 29—that is, 45 days. Thus the consumption for these 45 days was 66 lbs., not counting what may have been brought from the field. For the reason given before, I should say this must be little if any. The other three colonies received 227 lbs. of sections and 219 of feed. The returns were 362 lbs. taken, and an increase of 6 lbs. in the brood-nest. The experiment lasted from July 15 to Aug. 6, and was ended owing to the swarming of the colonies. Daily consumption was nearly 1⅓ lbs. There was practically no increase of brood in the three colonies. See *Bee-keepers' Review*, Nov., 1896, page 325.

The feeding back is always done in very warm weather, and with a contracted brood-nest. These two conditions minimize the amount of honey used for brood-feeding and production of the necessary warmth. Taking all into consideration, it seems to me 1½ lb. a day is a conservative estimate of the amount consumed by a good colony during the working season. In my locality that means 4 months, or 180 lbs. Then during the fall and latter part of summer the bees are not completely idle; more or less brood is raised, and some wax is produced. But even taking a consumption of only ½ lb. a day for the ensuing three months, that would make an additional 45 lbs. remaining the five months of November to March inclusive. I said once that it takes 49 lbs for winter. That may not be strictly correct. The bees here are flying very often, and raise quite an amount of brood, some of which is often chilled when the cold waves come, and therefore consume quite an amount of honey during the winter. But I know that a colony ought to have that much to be able to push brood-rearing to its utmost during the early spring, and be absolutely safe from the danger of starving should a week of raw rainy weather happen in April or May. However, let us put down 25 lbs. for winter, and we'll have for the year 250 lbs.

Knoxville, Tenn.

[The careful, conservative, and painstaking manner in which our correspondent has gone into this question, collecting and sifting the data and weighing the evidence, can not but win our admiration. If his conclusion is correct, that the average yearly consumption of honey per colony is 200 lbs. and over, then we may well ask the question whether it would not be possible to reduce somewhat this fixed loss, for the amount will be practically the same in a poor year as in a good one. There are at least two ways in which this may be done—1. By wintering indoors where practicable, and to regulate the temperature so that the bees will consume just enough and no more to keep up their existence. A cellar too warm or too cold will cause the bees to eat more than they require. 2. To stop unnecessary brood-rearing when that brood can not contribute a force of bees of the right age to secure a honey crop later on. If one has a strain of bees that will breed out of season he should get rid of them. In order to take advantage properly of either means one should study very carefully his locality; and right here it will be seen that there is a practical as well as a scientific side to this question.—ED.]

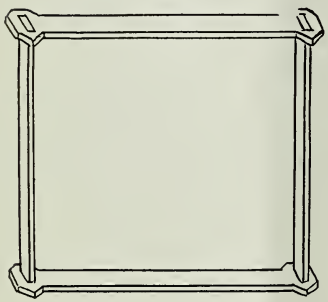
THE HOFFMAN FRAME.

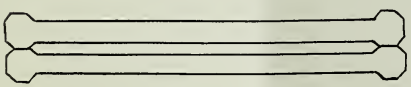
The History of Its Invention.

BY JULIUS HOFFMAN, THE INVENTOR.

Mr. Root:—As you wish me to write a little history of how I came to invent a frame

as I use it for my hives, and which has become known among bee-keepers as the Hoffman, I will hereby do so. To answer how I came to devise my frame, I shall have to begin this little history by going back to about 50 years ago. I was then quite a young fellow, but kept a few colonies of bees given to me by father. Hearing then of Dzierzon, his new methods, and his Italian bees, I made up my mind to see him. I walked to his place at Carlsmarkt, which was only about two hours' walk from my home, and had the fortune to see the "greatest bee-keeper of Germany." Dzierzon at that time had revolutionized bee-keeping all over Germany by inventing a practical movable comb. The combs were simply made movable by being built to a bar furnished





with a starter, suspended and movable in grooves cut in the sides of the hive. These bars were spaced by wire nails on one side, and practically self-spacing.

Later the Baron of Berlepsch invented a movable frame — about the same time, I understand, that Langstroth invented his frame in this country. The Berlepsch is a spaced frame, made so by projections on top and bottom bars. For hives as they were mostly used then in Germany, being worked from the side or back of the hive, the Berlepsch was practical, and a great improvement over the Dzierzon bar, but would not do for hives worked from the top, as are used in this country entirely.

Coming to this country in 1866 I brought along a colony of Italian bees, and after a time made up my mind to make bee-keeping my business pursuit. I began with the Berlepsch frame and hive, but soon found that I should have to change to a top-opening hive, and could not use the Berlepsch frame. I next tried the standing Quinby frame. Although the Quinby hive and frame is largely used yet in New York State by extensive and successful bee-keepers, I did not, for some reasons, adopt it. Then I tried the Langstroth, the best-known hive in America, but soon found I must have a spaced frame for rapid handling and accurate spacing, and, what is not less important, not to be a swinging frame on account of moving the hives.

I then constructed a frame with a top-bar of the Berlepsch style; the side-bars 1⅜ wide, close-fitting the whole depth of the frame; the bottom-bar ⅞ wide.

This frame suited me fairly well; however, after a fair trial I found there was more close-fitting about it than needed. So I narrowed the lower half of the side-bars to ⅞ wide, like the bottom-bars. Longer experience, however, induced me to have the close-fitting part of the side-bars only one-third the depth of the frame. This I found sufficient to secure straight hanging of the frames, and to reduce the squeezing of bees in handling, to an inconsiderable degree. Soon after, in order to reduce the contact of frames more yet, without sacrificing any of the self-spacing features, I devised the V shape on one edge of the side-bars, so that the V edge will meet the square edge of the joining frame. The frame as I have it now I have not been able to improve, and it works better in my style of hive than any other I know.

After the frame I use had come to your notice you thought well enough of it to manufacture and introduce it to the bee-keeping world, which you have done with remarkable success.

You have by this time modified the original Hoffman frame somewhat, so that Jacob H. Nellis made the remark in GLEANINGS once that you had modified some of the Hoffman out of it. However, I have no doubt that the frame as you make it now will suit best all round.

By the sample received I must say workmanship and material are a great credit to you. As there has been quite a discussion going on in GLEANINGS about the Hoffman, and in particular the V edge, I will in my next, if room is allowed me, say more about the V edge; also about division-boards and wedging, brace-combs, about spaced frames being interchangeable, how to handle spaced frames, etc.

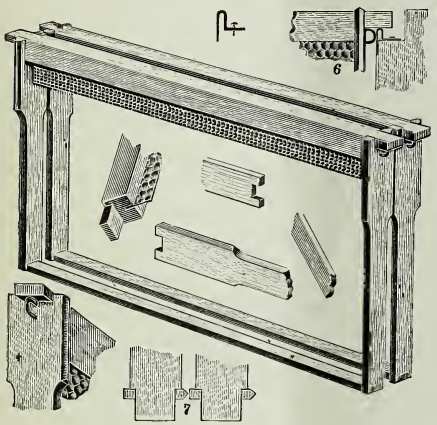
Canajoharie, N. Y., Feb. 24.

[It is true that we have modified the frame from the original Hoffman pattern adopted by the inventor; but conditions made this almost an absolute necessity. The original had widened-end top-bars like those shown in the lower diagram. These

ONE OF THE OUT-APIARIES OF THE A. I. ROOT CO., AT SALEM, NEW JERSEY, FROM WHICH WE SUPPLY BEES FOR OUR EASTERN TRADE.
SEE EDITORIALS.

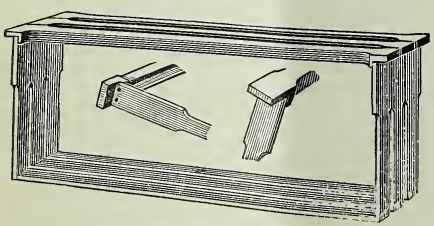
worked all right in connection with the widened ends in the Hoffman hive, which is a hive without a bee-space on top, but having the space under. On top of the frames is placed a quilt or cloth, which covers up the top-bars entirely. The frames rest in rabbets only ⅜ deep, or the thickness of the top-bar. This brings the top-bar flush with the top of the hive. When the quilt is laid on top, and the cover put in place, the widened ends of the top-bars are *entirely covered* so that the bees can not chink any propolis at the *ends* of the top-bars nor *between* them where they come in contact.

When we adopted the Hoffman frame nearly all hives made had a bee-space on top; and most modern hives sent out by the



HOFFMAN FRAME AS NOW MADE.

factories to-day are so constructed; nor are they provided with a quilt or cloth. After the hives had been sent out with Hoffman frames with widened top-bars it was soon discovered that, owing to the accessibility of bees to every part of them, the top-bars were propolized together, and against the end of the rabbet. This would never do. In order to secure the results obtained by



HOFFMAN FRAME AS ORIGINALLY MADE.

Mr. Hoffman it was necessary to make the Hoffman end-bars the only points that would come in contact, and to make the projection on the frame so that there would be a bee-space all around it and the same resting on a tin rabbet. This, in effect, secured exactly the same thing Mr. Hoffman's original hive and frame did, and at the same time made no modification of the then existing hives necessary. The Hoffman frame, as it is adapted to the regular Langstroth or Dovetailed hive, can be handled in every way that Mr. Hoffman handles his in his specially constructed hive. If we had continued to make the Hoffman frame as we originally put it out, following the exact details of the frame as first made by the inventor, it would have been necessary to modify all existing hives in use. It can be readily seen that that would be impossible. It was, therefore, necessary to make a change in frame.

In order that the reader may more fully understand the comparative differences, we show here first an illustration of the Hoffman frame as we are using it to-day, and, second, the original Hoffman with widened top-bars which we first adopted after the Hoffman pattern, but which we were compelled to abandon for reasons already given. —ED.]

THE CONFUSION IN THE GRADING-RULES.

Which are Correct—those in the Review or in Gleanings?

BY WM. MUTH-RASMUSSEN.

Mr. Root:—Last year I wrote you about the difference in the Washington grading-rules, as printed in GLEANINGS and in the *Bee-keepers' Review*. The communication was printed in the October 1st issue, pages 941, 942. In your footnote you called for an explanation from those who had had any thing to do with the revision of the rules, but no explanation has been forthcoming. At the same time, I sent an exact copy of my article to the *Review*, but Mr. Hutchinson took no notice of it whatever. I am, therefore, no wiser than I was before I wrote you on that subject.

The bees have begun swarming here, and the honey season will soon be upon us. We shall then need the grading-rules again. As a general thing I have comparatively few sections which fit the rule for "Fancy," as given in GLEANINGS; but I have large numbers of *just as perfect* combs, lacking merely the sealing of the outside row of cells. These latter I have hitherto graded as No. 1; but if the rules in the *Review* are correct (and they are still standing unchanged, as last year), I have lost many dollars when selling by grades, as such sections might just as well have gone into the "Fancy" grade, and brought the corresponding price. If the rules in the *Review* are not correct, why are they not made so? As I said in my former article, when a bee-keeper takes both papers and reads the two different sets of rules, which paper shall he follow? Self-interest would say, "The *Review*," as the

FIRST PRIZE PICTURE OF APIARY. ERNEST W. FOX, HILLSBORO, WIS. SEE EDITORIALS.

rules there are easier, and favor the producer.

Now, there may, perhaps, be another way of getting at this matter. Let us hear from the large dealers in comb honey. Do they accept and pay for, as "Fancy," sections graded according to the rules as given in the *Review?* If they do, I shall certainly be the gainer by it. If they do not, I shall not be any worse off than before. But I have for many years worked to establish a reputation for conscientious grading; and if I can increase my income without injuring my reputation I do not see why I should deny myself that privilege.

Independence, Cal., April 12.

[I spent some little time in looking over back numbers of GLEANINGS, but failed to find the article or articles which criticise the Washington grading as now given in the *Bee-keepers' Review*, and urge a modification which we adopted some five or six years ago and continued at the head of our Honey Column. For the convenience of our readers we reproduce the grading as given in the *Review*, and also the grading that we have adopted. The latter we will style GLEANINGS grading, and the other the Washington grading.

WASHINGTON GRADING.

The following rules for grading honey were adopted by the North American Bee-keepers' Association, at the Washington meeting, and, so far as possible, quotations are made according to these rules:

FANCY.—All sections to be well filled; combs straight; of even thickness, and firmly attached to all four sides; both wood and comb unsoiled by travel-stain or otherwise; all the cells sealed except the row of cells next the wood.

No. 1.—All sections well filled, but combs uneven or crooked, detached at the bottom, or with but few cells unsealed; both wood and comb unsoiled by travel-stain or otherwise.

In addition to this the honey is to be classified according to color, using the terms white, amber, and dark. That is, there will be "fancy white," "No. 1 dark," etc.

GLEANINGS GRADING.

FANCY.—All sections to be well filled, combs straight, firmly attached to all four sides, the combs unsoiled by travel-stain or otherwise; all the cells sealed except an occasional cell, the outside surface of the wood well scraped of propolis.

A No. 1.—All sections well filled except the row of cells next to the wood; combs straight; one-eighth part of comb surface soiled, or the entire surface slightly soiled: the outside of the wood well scraped of propolis.

No. 1.—All sections well filled except the row of cells next to the wood; combs comparatively even; one-eighth part of comb surface soiled, or the entire surface slightly soiled.

No. 2.—Three-fourths of the total surface must be filled and sealed.

No. 3.—Must weigh at least half as much as a full-weight section.

In addition to this the honey is to be classified according to color, using the terms white, amber, and dark; that is, there will be "Fancy white," No. 1 dark," etc.

He will see that the GLEANINGS grading, if we may call it by that name, specifies a Fancy, A No. 1, Nos. 1, 2, and 3. The Washington grading names only Fancy and No. 1. Our A No. 1 provides for something a little finer and better than the ordinary No. 1, while our Fancy is strictly this and nothing else. As nearly as I can remember, the criticism of the Washington grading was that it did not provide for a lot of honey that was one grading higher than the Washington Fancy; that, furthermore, a strict interpretation of the Washington Fancy would allow a class of honey that was practically only No. 1. There were some producers at the time who were producing some tall sections behind fences, who were able to get nearly every cell filled next to the wood. It was these who demanded a grading for themselves. Perhaps it would have been better to leave the Washington grading as in was, and then have an "Extra Fancy." Since the grading-rules by the North American Bee-keepers' Association in convention were adopted, the science of better filling of sections has progressed somewhat, necessitating a higher grading. The grading-rules adopted by this journal are not hard and fast, and can be modified to fit existing conditions.—ED.]

THE FOLLY OF SENDING UNRIPE HONEY TO MARKET.

A Serious and Important Matter; How Some Bee-keepers are Killing the Goose that Lays the Golden Egg.

BY R. A. BURNETT.

I have just read the article by Mr. E. D. Townsend on the importance of having honey ripe when it is put upon the market. Last autumn we sold a barrel of honey to a man who would use about 500 lbs. per week. We had sampled one of the barrels of the lot, and found it to be well-ripened honey; but as the lot was from different producers, having been consigned to us by a dealer, the barrel which he got proved to be of a low quality in flavor, wholly from the standpoint of having been extracted when the honey was not cured sufficiently to give it flavor or prevent its separating, so that there was about half a gallon of water in the barrel, that had been exuded during the candying process. This caused the man to return the package and the so-called water in a can. We endeavored to satisfy him by offering to substitute another package for it, but he felt that he could not afford to risk it, and said he had great difficulty in getting honey of one producer whom he knew always had good honey. The result of it was, we lost a customer for honey, and the man who sent us this unripe honey missed the sale of several hundred pounds of his product.

It is our opinion (which we have voiced for some years) that unripe honey has had more to do with the curtailment of its use by people generally than any other one thing, if not more than all other causes put together; for when a person gets a coarse-grained flavorless extracted honey he does not like to throw it away nor return it to the vender, but keeps it around until everybody in the family tires of seeing honey, and gets

out of the habit of using it, sometimes for years.

If we fail to give people a good article it will be time thrown away to try to convince them they should buy more of it. Producers of honey should be free from commercial selfishness to the extent that they should seek quality before quantity. We will venture the opinion that, if the honey to be gathered in 1905 be allowed to ripen in the hives before being offered for sale, the consumption of honey will be greatly enhanced; and that, if that is kept up without variation for the next five years, the amount consumed will be double what it has been in the past five years. It seems to us the remedy is very simple, from the fact that it lies wholly in the producer's hands.

In conclusion we will say this: Beginning with the crop of this season, any unripe honey that comes to us will not be offered for sale, but held subject to the owner's orders. It might be that a unanimous understanding to this effect among honey-dealers would be a most effective means of stopping the unwarrantable greed of the producer who endeavors to market a product that will bring him money at the expense of all intelligent and honorable producers.

Chicago, Ill., April 22.

[The writer of the above, Mr. R. A. Burnett, is the head of one of the largest commission houses in Chicago—one that makes a specialty of buying honey. What he has to say is only too true, as we know from an extended correspondence. There is no excuse at all for any bee-keeper who is able to produce a crop of honey for sending that honey in an unripe condition to market.

There are hundreds of other instances exactly like this given by Mr. Burnett. I remember in particular a case where a large commission house had bought a carload of honey of one of the most extensive producers in the United States. He bought by sample, and some of the packages were like the sample, and some were not. Well, the head of the commission house took a large buyer (who happened to be in evening dress to attend a party) to look at some of this fine honey. Both of them stood over the bung of a barrel of the honey, while the seller. with a hatchet, was leisurely knocking the bung out, when there was a loud pop and a blow like a safety-valve blowing off. Fermented honey shot all over both of the men, up against the ceiling, and all around the room. The seller was disgusted, and the buyer went off mad. What happened? The seller never bought any more honey from that bee-keeper, and the buyer never came into the store.

There have been some fearful jangles between bee-keepers and honey-buyers. The former are not dishonest but simply careless or ignorant, or both, and then complain of the difficulty of selling their honey. I know of some bee-keepers who grade their extracted honey so carefully that the buyer always knows without a sample what he is getting. Their crops are often disposed of, even before the bees gather them, and why? Because the buyer knows, without any peradventure, that the honey will be thick and ripe, and that the uncapping-knife will have passed over every inch of the comb before it is extracted.

It is a well-known fact that a strictly fancy article of comb honey always sells, and sells quickly. The same rule applies to a strictly fancy article of extracted honey providing it is sent to a market where the consumer is familiar with the source or flavor of it.

Mr. W. A. Selser, of Philadelphia, buys thousands of pounds of extracted honey for bottling purposes; but he will buy only a fancy, and only that honey (clover) with which his trade is familiar.

I wish our bee-keeping friends would read over Mr. Burnett's article very carefully, and then act accordingly.

But you say, "What are we going to do with the off grades?" Ship them to the manufacturer, i. e., the baker or confectioner; but do not blend them with a lot of good honey and spoil the whole.—ED.]

PICKLED BROOD.

A Disease that Resembles it and yet is Like Foul Brood; Italians Suffer Less.

BY E. F. ATWATER.

The articles on pickled brood, in recent numbers of GLEANINGS, prompt me to tell of my experience with it.

In South Dakota, where hybrid bees were the rule, the Italians were almost immune, while blacks or hybrids were liable to be seriously weakened. The introduction of vigorous Italian queens stopped the disease in every case with which I am familiar—not that the Italians were entirely free from it, but seemed to suffer far less, and to clean out the cells containing the dead larvæ far more readily than the blacks or hybrids.

Some think it is a starvation disease; and, while it is usually less apparent in a good flow, yet I have known a strong new swarm of hybrids to be ruined, for honey prospects, by the disease. during a fair flow. The experience of Mr. Thomas Chantry, then of Meckling, S. D. (where he had at that time several hundred colonies), was that the introduction of Italian blood was the best remedy. I call on Mr. Chantry to give us the result of his extensive experience with pickle. Here in Idaho, with Italians, almost all of pure blood, I have seen considerable pickle, but no colony apparently seriously damaged.

As yet I have not found it necessary to treat the disease in any way. We also have another condition which is exceedingly puzzling. When a new swarm (or even occasionally an old colony) becomes queenless, and develops laying workers, or has a drone-laying queen, some of this drone brood,

mostly in worker-cells, dies, and assumes an appearance varying from that of pickle to almost the appearance of foul brood. Some is slightly ropy, some is not (as in pickle), and in time it dries down to a hard scale on the lower cell walls, where it adheres quite strongly, much as in foul brood. I have usually melted such combs; but where such colonies have been robbed out, no foul brood has developed. I want to know if you, Mr. Editor, or some of your readers, can tell me if the above is a brood disease. So far as I remember, it has appeared in only two of my yards near Star, Ida., where there is some pickle, and rarely a case of genuine foul brood. We now have foul brood in several widely separated localities in Idaho, and it is spreading rapidly in at least one of our valleys, and I think all owing to the kindness of some bee-keepers who brought their bees from other States. However, we are not at all bitter toward them, nor has any one been treated as H. H. Hyde once suggested in GLEANINGS, his "bees burned and himself drummed out of the country."

Another subscriber of GLEANINGS will locate here soon, and probably favor us with another supply of foul brood, yet we all extend him the "glad hand."

I think that, if a bee-keeper in a foul-brood locality wishes to move to a better country, if he can not sell his entire outfit he should kill the bees, melt the combs, boil every thing, and bring his hives, wax, and outfit, buying bees at his destination.

Now please ask some of your Cuban readers to tell us exactly, in every detail, how to make a success producing *extracted* honey in a foul-brood locality, for that is just the knowledge that will soon be worth dollars to some of us here in Idaho as well as elsewhere.

Meridian, Ida., Jan. 13, 1905.

[We have had some samples of diseased brood sent us which, on microscopic examination, showed the presence of germs of both pickled and foul brood; but if foul brood were present at all it would make a condition requiring just as urgent and thorough treatment as if no pickled brood were complicated with it. It is barely possible you have had a combination of the two diseases, but that is improbable. We have examined hundreds of specimens of pickled brood, and have found that they vary somewhat in characteristics. Sometimes the dead matter will rope some, but never quite enough to reach the long stretch of the characteristic foul brood. The very fact that this pickled brood does not spread like foul brood goes to show that what you have is not that disease—*Bacillus alvei*.

The moving of bees from one locality to another, especially from a locality infected with foul brood into one free from it, should be most severely condemned. There ought to be a United States law putting a stop to any thing of this kind. Such a law would not necessarily prevent the importation of bees from one State to another, but it would require that bees before removal be inspected by some State inspector or other competent person, and that the locality for several miles around be pronounced free from the disease.

One of our corresponents, Harry Craven, will shortly answer in these columns just the question you ask regarding the handling of foul-broody colonies for honey.—ED.]

WHERE PURE ORANGE HONEY IS OBTAINED IN FLORIDA.

Some Characteristic Scenes.

BY W. W. CRIM.

Some of the bee-keepers who think there is no pure orange honey made should come to Manatee Co., Fla., the first of March, and stay just one month. They would surely be convinced that there is considerable honey in orange bloom. I believe there are several colonies of bees here that have furnished a surplus of 25 lbs. of pure orange honey, as pure as clover, alfalfa, or any other honey. If there is any thing for the bees to work on during orange bloom I have failed to find it. If the bees could be put in condition to do good work on the orange I do not doubt that 50 lbs. could be harvested. As the orange is the first bloom to work on, it finds the bees in poor condition to harvest a good crop. I do not know how this season compares with others, but surely there was a good flow this time. The man who thinks of coming here to keep bees for orange honey had better go slow. I came here for that purpose, and will go back to Indiana in June. All the honey here is too dark, except the orange, and that is not nearly as white as the samples generally called orange honey.

I send you some photos of Mr. Rood's bees just at the close of orange bloom, March 27. The first view represents the home apiary showing strength of three-story hives; about 50 hives in this yard.

The second view shows bees on and under the hives.

The third view is called Cedar Hammock yard, and has about 75 colonies.

The last view shows the way the little folks live in Florida. If you do not think there is lots of good exercise in climbing palmetto-trees, come down next orange season and try one. I have.

Palmetto, Fla.

[We note trellises overhead in Figs. 1 and 3 in the view shown, doubtless for the purpose of affording shade by means of a trailing vine of some some sort during the middle of the day. There are no shadows to indicate whether these trellises are ranged directly east and west so that the hives may be shaded from morning till night; but in the absence of any statement to the contrary we will assume this to be the fact, for this is the rule in Arizona, where an overhead shade of this kind is almost a matter of necessity.—ED.]

DIAGNOSIS FROM THE OUTSIDE.

"Good morning, Mr. Doolittle."

"Good morning, Mr. Wolfe."

"I have come again for another conversation on the diagnosing, from the outside, of a bee-hive, so as to tell what is going on inside. But before asking further questions I wish to thank you for telling us what you did in this matter in the May 1st GLEANINGS."

"That is all right, Mr. Wolfe, and I shall be just as pleased to serve you further, so far as I am able, as I was to tell you what I could before, so go ahead. What do you wish this morning."

"The first thing I wish to know about is, what it means when bees cluster all over the front of the hive, and hang down on and under the alighting-board?"

"It generally means one of two things, and quite often both of them—first, that it is very hot; second, that the colony has become numerous in bees."

"Why do you put the *hot* first?"

"Because, when it is very hot even weak colonies will cluster on the outside of the hive—many times those which do not have more than a quart or two of bees. I have seen the bees in a comparatively weak nucleus come out on the outside of the hive in nearly proportionate numbers with full colonies on days when the mercury went from 90 to 95 degrees in the shade?"

"That is something new to me. I did not suppose such colonies would hang out at all. I have read that such hanging out was a sure sign that the bees were going to swarm, and so I expected that would be the answer you would give to my question."

"Clustering out in hot weather has very little to do with the matter of swarming; for with us, in this locality, far more clustering-out is done out of the swarming season than in that season. In hot weather, during the latter part of July and the first half of August, we often have the hives 'black' with bees for days and nights at a time, and that at times when we know the bees will not swarm, because there is an absolute honey dearth—so much so that, should we try to open hives, we should have robber bees about in short order. All know that bees do not swarm when there is such a honey dearth on."

"But do you not think that it is a sign of

FIG. 1.—ROOD'S HOME APIARY SHOWING STRENGTH OF THE THREE-STORY HIVES, FLORIDA.

swarming when bees cluster out in moderately warm weather, a little before and durring the swarming season?"

"Such clustering-out at that season of the year, when honey is coming in from the fields, tells us that the colony is populous enough to swarm, and that it may do so; but even when we conclude that way, some colony which has not clustered out on the outside of the hive may be the first one to swarm."

"Then is there no way of telling from the outside of the hive just when a colony will cast its prime swarm?"

"Not that I know of; but the *Bee-keepers' Review* told us a year or so ago that some bee-keeper had told the editor of that paper a sure way of telling, which was so simple that he (the editor) wondered no one had thought of it before; but he was not allowed to divulge what it was. He thought that, if enough of the readers of the *Review* would pledge $1.00 each to reach up into the hundreds of dollars, the one having this knowledge would let him print the matter, thus giving it to the public. But as I have not heard a word in the matter for nearly a year now, I suppose that this great boon to bee-keepers is to be locked up in the grave when the bee-keeper and Mr. Hutchinson pass to the beyond."

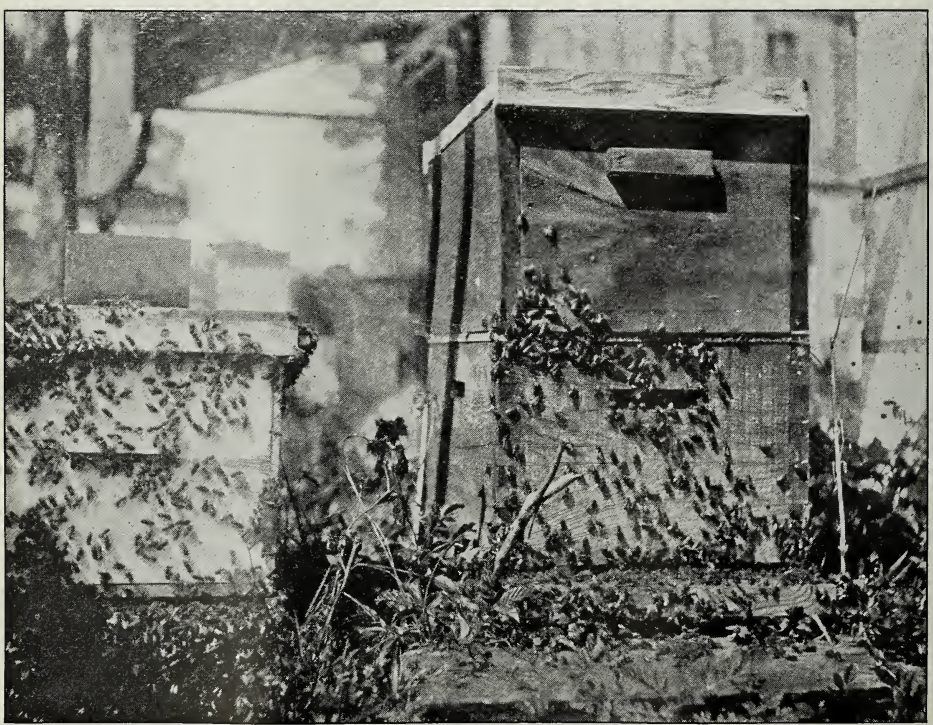
"Don't you suppose that bee-keeper ever gained any knowledge from reading what others have freely given to the public?"

"I could not say as to that, and, even if he had, he has a right to keep the knowledge he has to himself, if he feels so disposed."

"I suppose so; and as he seems likely so to keep it, how am I to tell just when the prime swarm will issue?"

"If, on opening the hive, we find eggs in queen-cells, we are quite sure such a colony will swarm in from six to nine days, providing the weather and honey-flow remain good, for by that time some or all of those queen-cells will be sealed; and on the sealing of the first queen-cell comes the prime swarm. If we find larvæ in the queen-cells the swarm will come from one to six days later, just in accord with the age of the larvæ in these queen-cells. And allow me to say that I find such eggs and larvæ in queen-cells nearly or quite as often in colonies which have not clustered on the outside of the hive as in those which have. This is not outside diagnosis, I am well aware, but it is far better than not knowing any thing for certain in the matter, as was the case with our fathers."

"Yes, that is right. But another thing which I wish to know is, how can I tell, after any colony is through swarming, whether the young queen has become fertile and laying in the hive? Can this be told from the outside?"



F.G. 2.—BEES CRAWLING AROUND THE OUTSIDE OF THE HIVES.

"Yes, or very nearly so. After the prime swarm has issued, it takes from 17 to 25 days before the young queen can emerge from her cell, take her wedding-flight, and commence to lay. There are cases where a less time has been known, and also where a greater time is taken; but 99 out of every 100 queens that take the place of the mother queen, which went out with the swarm, will get to laying between the days I have given; for, nine days after the swarm issued, there will be brood in the larval state in the combs after the mother queen leaves, and there can be no more brood in that state till it comes from the eggs the young queen lays. The bees seem to realize this, and so carry in very little pollen after ten days have elapsed from the time the old queen left; but as soon as the little larvæ from the eggs of the young queen begin to hatch, the bees go to carrying pollen with a will, especially quite early in the morning. Whenever you see pollen going thus early in the day into hives having cast a swarm from 17 to 25 days previous, you may be quite safe in saying *that* colony has a young laying queen; and if, in addition to this pollen, you find the bees at work with a 'vim' in the supers, you may rest assured that that colony has a laying queen all right."

"That looks reasonable."

"And I wish to say further that, if you do not see pollen thus going in, and do not see any work going on in the supers, or very slowly, while the bees about the entrance of the hive seem listless, after from 25 to 28 days have passed from the issuing of the prime swarm, you will, without doubt, find that colony queenless, and you should attend to it at once, by giving it a frame of brood in all stages, else you will be likely to lose it. From my own experience, and the numerous letters I receive on this subject, I am led to believe that hundreds and thousands of colonies are lost every year in the United States by their failing to get laying queens again after having swarmed."

"Will the frame of brood insure them a queen?"

"Not always, nor generally in time for them to become good colonies for winter; but it *will tell* whether they have a queen or not by their starting queen-cells on this brood if they are queenless. Look at this frame of brood three days after giving it; and, if queen-cells are started, procure a queen for them from some source, or give them a frame of brood from some other colony every week till a young queen from one of the cells built becomes fertile. But the queen is better if given from elsewhere, for queens reared under the circumstances such a queen would be reared are not as good queens as you should have in your apiary."

FIG. 3.—ROOD'S CEDAR HAMMOCK YARD, PALMETTO, FLORIDA.

"I find nearly every spring that some of my colonies come out queenless, evidently having gone into winter quarters that way. Is there any way I can tell whether colonies are queenless in the fall without opening the hive and seeing the queen? I have tried thus looking for them, but the late fall is a hard time in which to find a queen, as she is not breeding then, and the bees thickly clustered together."

"I know it is hard work to find a queen late in the fall, and for this reason I never hunt for them unless it is absolutely necessary to find one for some reason. But it is not necessary to hunt for the queen to tell whether a colony has a queen or not, as a little smoke on any *warm* evening will tell you whether a colony is queenless or not at that time of the year. If you have a colony you mistrust is queenless, go to it between the time of sunset and dark, or what would be called early twilight, and puff in at the entrance a little smoke two or three times. If you hear a loud mournful roaring in the hive for some length of time after this smoke has been blown in, you may know *that* colony is queenless. By trying this plan on a colony having a queen, and one which has not, you will ever afterward be able to tell at once in this matter."

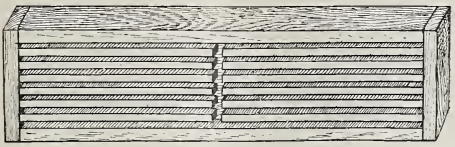
AN OUTDOOR ATMOSPHERIC FEEDER MAKING USE OF A MASON JAR.

I am sending you an atmospheric bee-feeder of my own construction, which I think should "take the cake." Its construction will be clear from the illustration. It is designed for an outdoor feeder, but can also be used in the upper story of a hive just as well, and this is the way to use it:

Fill a two-quart Mason jar with honey and water, half and half. Invert the feeder and lay it on top of the jar. Now, holding the jar in one hand and the feeder with the other, make a dextrous motion to invert the two at once so as not to spill any feed, and set it in a level place, say on top of a hive or on a box previously prepared for it. It works on the atmospheric principle—that is to say, the feed flows down out of the jar as fast as the bees take it out of the grooves

FIG. 4.—THE WAY THE LITTLE FOLKS LIVE IN FLORIDA.

sufficient to admit air. Don't think that this feeder needs an extra flange around it to prevent overflow. Experience shows that, if perfectly level, the feed will stand



so as to fill the grooves about two-thirds full when unmolested; but when the bees get after it they will never allow it to reach the ends of the board. W. T. CARY.

Wakenda, Mo., April 10.

[This feeder is the same that we used many years ago in our own yards, and illustrated in the early editions of our A B C of Bee Culture under the head of "Water." We used, however, a solid grooved board or block. The feeder is an excellent one, even if it is old. We used it all last summer (on a larger scale) for our outdoor feeding.—ED.]

ZINC FOR RECORD-CARDS; ITALIANS AS CELL-BUILDERS.

My queen-registering cards are ahead of any thing else I have ever tried. They are made of pieces of zinc 2½ long by 2¼ wide, with a hole punched through the top so that they may be hung on the north side of each hive by a small nail. It is an old idea, but a nearly perfect one.

Write with a lead-pencil; and when the card is full take a scouring-pan to the bee-yard and go from one hive to the other and clean each zinc, after which rewrite the last item at the top.

It is a well-known fact that black bees or hybrids which have their queen taken away will build much finer queen-cells than Italians under the same circumstances.

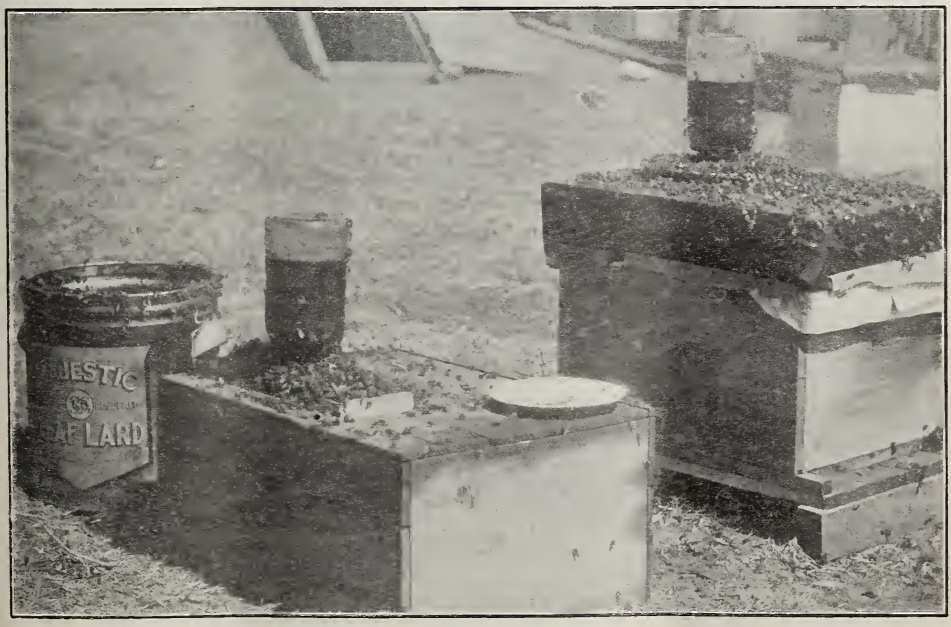
Will Italian bees build just as good queen-cells above a queen-excluding honey-board, with a queen laying in hive below, as would black bees under the same conditions?

South Bend, Ind. C. A. BUNCH.

[Just as good queen-cells will be built above perforated zinc, with a laying queen below, as under other conditions, providing the cells are *once started*. Sometimes bees will not start cups or cells above. Black bees or hybrids may build a few more cells than Italians; but the difference, so far as I remember, is not great. Eastern races, however, will far excel either Italians or blacks.—ED.]

BEE PASTURAGE FOR SALE; HOW COULD THE BEES BE KEPT FROM TRESPASSING?

On page 314 Mr. Murphy suggests the renting or selling of bee pasturage by public sale, to which you point out the difficulty arising from the disposition to be made of the money. This is not the point that troubles me. I am partly of Henry George's views of land, and wholly so as regards the nectar of flowers. Like the fish in the stream and the game in the woods, the nectar is the heritage of the people. The land-



THE GROOVED BOARD AND MASON JAR FOR OUTDOOR FEEDING.

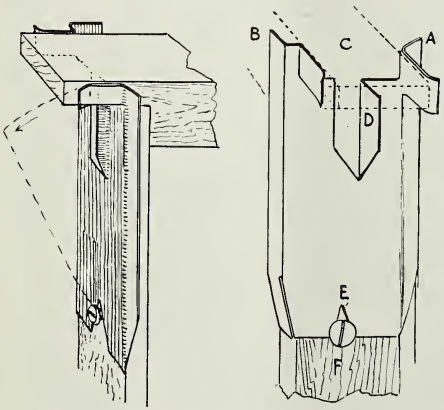
owner can do nothing to produce or prevent it except as he raises crops that are honey-bearing or otherwise; and a large share comes from the wild plants by the roadside. Then the rental should go into the county or township treasury, or, perhaps, to the road district or school fund. But what troubles me is, how the man will get what he has bought, or keep his bees from trespassing. If he buys three miles square, and is allowed to set his bees in any place on the territory, he can get all the honey on six miles square if he has sufficient bees to do it; and the man buying the territory adjoining would be robbed of part of his right, for it becomes personal property after he buys of the community. J. H. HAUGHAWOUT.

Fairmount, Neb.

[I do not see but you would have to buy up the territory for six miles of flight; or, to put it more exactly, the bee-keeper ought to be able to control a radius of two miles of flight to every yard. Well, he can't do it, that's all, unless the territory were sold at a very low figure per square mile.—ED.]

A REMOVABLE METAL FRAME-SPACER.

I mail you a sample of my metal frame-spacer. It is impossible to put it on wrong, as wide wooden end-bars are sometimes nailed up in all sorts of ways. They could



probably be made for one-fourth cent each, as it may be stamped from sheet metal, instead of making it the same as the sample—perhaps as thin as ordinary tin.

Bairdstown, O. A. J. OBERLITNER.

[The metal spacer shown above is quite similar to a device we illustrated some time ago. They will be quite expensive as compared with the ordinary Hoffman frame; and while, to a certain extent, removable for the purpose of uncapping, I question whether they would give the satisfaction of the ordinary wooden widened end.—ED.]

PUTTING UP EXTRACTED HONEY.

We have invariably found it best to use large tanks because of the proneness of honey to "work." Despite the most favorable circumstances, honey will foam when agitated, that being the worst period for several days after extracting. Large tanks obviate this trouble partially. Then they give a uniform color, flavor, and ripeness, which are necessary when selling by sample.

T. WORTHINGTON.

Leota, Miss., April 11.

[What you have to say refers, I should judge, to your own locality or to any honey that has a tendency to "work" or ferment. Still, it is an advantage in any locality to use a large tank in order that the honey may all have the same blending, quality, flavor, and body.—ED.]

STRAINING AND SKIMMING EXTRACTED HONEY; HOW TO RETAIN THE NATURAL FLAVOR.

On p. 364 I see by your footnote to E. D. Townsend's article on putting up extracted honey that you have called for the opinions of others on the care or proper shape to have honey fixed up to fill the bill, so I submit my plan, which will, perhaps, help some to give the public honey which has not lost its flavor by being exposed unnecessarily to the air, and which has no scum on the tops of the cans. I store my honey in large oak barrels that have been waxed inside and painted on the outside. All the barrels stand on a low counter, and each barrel has a large top in it, and all have the top end taken out. I spread a cheese-cloth over the barrel, and drive a hoop over this to hold the cheese-cloth on. I then spread another cheese-cloth over it, which can be lifted off, washed, shaken, and spread on again. As soon as the first barrel is nearly full I take off the cheese-cloth and draw enough honey from the bottom of the second barrel to fill up the first one. I then put about six newspapers over, and drive the hoops over these tight so as to keep the honey from losing any of its flavor. As the honey has been run into the barrels warm, and sealed air-tight with papers, it retains its flavor and also keeps longer from granulating.

After these barrels of honey have been sealed over this way for about twelve days I drive up the hoops, remove the papers, and skim off the little thin scum and put the newspapers over again and drive the iron hoop over these so as to keep the honey air-tight. When I run the honey out of these barrels into tins I seal them at once so as to retain the flavor of the honey.

WM. MCEVOY.

Woodburn, Ont., April 10.

[I will explain to our newer readers that Mr. McEvoy is the official foul-brood inspector for Ontario, Canada; he is also one of the leading bee-keepers of that province. He does not write for bee-journals very often; but when he does he invariably has something worth reading. The suggestion he has given above is excellent, so that the beginner or the veteran may well profit by it.—ED.]

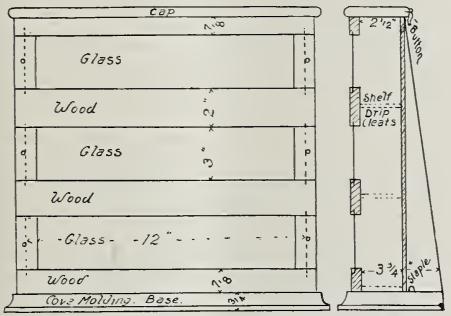
IMPROVEMENT ON BEE-ESCAPE BOARD.

I send you some sketches of some kinks I have used to save trouble and to sell honey.

In taking off honey with Porter's bee-escapes I have two short strips nailed on the upper side of the board, reaching from the side rim of the board to the hole in the escape. These guide the bees to the hole and make them leave the super much easier.

SMALL SHOW-CASE FOR COMB HONEY.

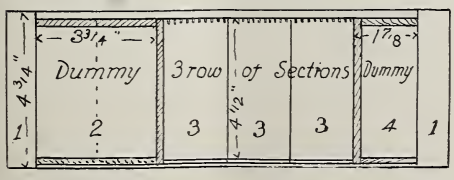
Last fall when marketing my honey I gave each merchant who took five or more 24-lb. cases one show-case to display 9 sections on his counter. They were stained walnut, and varnished, and showed the white comb honey finely. The front of each show-case was arranged with grooved strips,



3-inch glass, and end-blocks, just like a shipping-case, and the honey rested on shelves with paper and drip-cleats. I show dimensions above for 4¼ sections. They cost about 25 cts. complete.

DUMMIES FOR THE SUPERS WHEN IT IS DESIRABLE TO GET A FEW UNFINISHED SECTIONS FILLED OUT.

Last fall, when nearing the close of the honey-flow, in order to have as few unfinished sections as possible I made two sizes of dummies—little boxes—the length of the inside of the super, and 4½ inches wide. One size was 3¾ inches deep, and the other 1⅞ deep. These I placed on their sides with the open part of the boxes next to the sides of the super. The largest size occupied the space of two rows of sections, and the smaller the space of one row. By their use, putting in two small sizes, one of each size, or

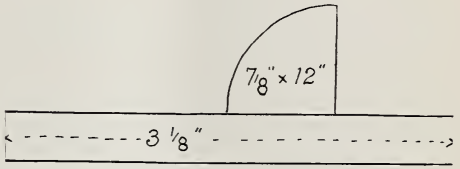


two of the larger size, I could place four, three, or two rows of partly filled sections in the center of the super over the brood-nest where they would be more likely to be filled out.

By adopting this plan my proportion of unfinished sections was much less than before. These dummies are easily made out of scraps of thin boards, and will give lots of satisfaction. The bees can not get in behind the dummies, but have access only to the sections.

DEVICE FOR NARROWING ENTRANCES IN WINTER.

I use entrances ⅜ for summer. In the fall I nail strips of ⅞-inch quarter-round molding as long as the width of the hive inside on to little pieces of lath, as shown above, and slip these in the entrances for winter. This



keeps the bees warmer, prevents robbing, and prevents clogging up the bottom-boards as easily as they would were they turned over with the ⅜ cleats uppermost for winter.

Stamford, Neb. D. R. WAGGONER.

[Your suggestions are all good, friend W. That arrangement which directs the bees toward the bee-escapes may have a good deal of merit in it. It has struck me that it would be advisable, perhaps, to carry the same idea a little further—run a strip of wood from each corner of the escape-board clear up to the escape itself. This would divide the board into four pie-shaped inclosures, with the nose of the "pie" running clear to the escape. The suggestion is respectfully referred to R. and E. C. Porter, the inventors of the bee-escape, who have experimented with this particular escape in a hundred different ways; and if they say the suggestion is all right the Root Co. will proceed to get out these escape-boards with the pie-shaped divisions mentioned.

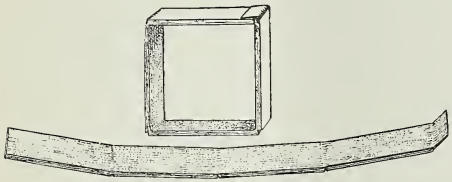
The show-case for displaying honey is a good one, and I am not sure but the manufacturers ought to list it in their catalogs. It would be very cheap, and make a fine display in show-windows and on retail counters.

Dummies in comb-honey suppers—I believe this idea has been suggested before; but I see no reason why, at the close of the season, or whenever the season is light, these dummies could not be employed to excellent advantage. A No. 1 section will bring, perhaps, twice as much money as an unfinished one; and if the intelligent use of dummies at certain seasons of the year will double the money at the tail end of the crop, as stated by our correspondent, we may well give it a test.

The entrance-contractor is a good one, although something quite similar has been suggested before—I think by our friend E. F. Atwater, of Idaho.—ED.

PASTEBOARD AS A MATERIAL FOR SECTIONS.

In response to your request I am sending you a sample of my pasteboard section unfolded, and also one formed, and filled with honey. The board that I used last year was too light, and I should prefer to use that as heavy as No. 15 or 20, which is 15 or 20 sheets to the bundle. The sheets are 26× 38, making 35 plain 1½-inch sections; then 20 sheets to the bundle will make 700 sec-



tions at a cost (for material) of $1.75. Strawboard is quoted at $1.75 per bundle, or $42.50 per ton (50 lbs. to the bundle). I have been told that strawboard can be bought for $27.00 per ton in car lots, making it less than 75 cents per bundle by the car. The cost of material depends, therefore, upon the quantity you buy.

Those that I used last year cost about one cent each; but this cost was mostly for changing the machinery for cutting. The making can be done very cheaply, but I can give no definite figures. Those that I have prepared for this year have white paper pasted on the outside. CLYDE CADY.

Grass Lake, Mich., March 22.

[I saw a shipping-case full of these pasteboard sections containing honey, at the Michigan State convention at Grand Rapids, and was surprised at the result. Some of the edges were gnawed, but Mr. Cady stated that this happened only when they were left on while the bees had nothing to do. Although the pasteboard may not make as firm a section as those now used, yet it is possible that bee-keepers may have to use it on account of the scarcity of basswood. Attempts have been made to obtain other kinds of wood for sections, but none have been found as yet, white or dark, that will bend without breaking.—H. H. R.]

LAYING WORKERS.

Have you ever seen laying workers in the act of laying?

This summer I put a frame of brood containing two sealed queen-cells in an observatory hive. With regret I saw that neither cell hatched; so, indifferently, I let this nucleus remain unnoticed for some time. Later I was surprised to find eggs in some cells. This became interesting, so I watched every day. Soon I saw five or six eggs in a cell. One day I saw the laying worker in the act of depositing eggs. The next day I saw two side by side in the same occupation. Then I watched for any extraordinary attention which they might receive from the others, but saw none. They mingled with the common bees unnoticed, and would soon be lost to view. I find no difference in their appearance from the others. C. J. THIES.

Pepin, Wis.

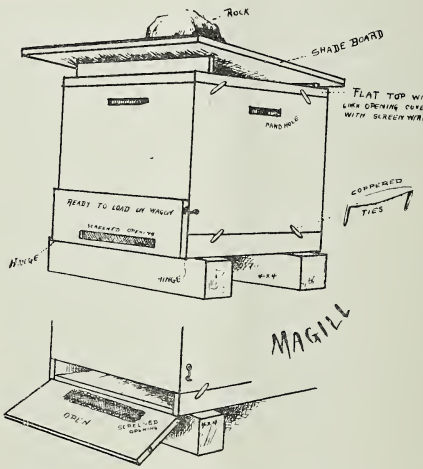
[Dr. E. F. Phillips, of the University of Pennsylvania, who has spent hours, days, and weeks watching fertile workers, was requested to answer these questions, which he has done.]

Last summer I caught five workers in the act of laying eggs in cells on one side of one frame within about three-quarters of an hour. While in the act of laying, these workers received almost as much attention from the other workers as does a queen under similar circumstances; but within a minute or two they cease to follow the fertile worker. It would seem that, during oviposition, and for a short time after, the workers are attracted to the fertile worker by some odor, or in some other way, just as they are attracted to the queen. All the workers which were observed laying at this time and at other times were almost hairless, and were probably old.

E. F. PHILLIPS.

COMBINED ALIGHTING-BOARD AND ENTRANCE-CLOSER.

I send a sketch of an entrance-contractor that is adjustable, always held against the top of the entrance. The wooden part



should be made in accordance with the size of the entrance. F. B. MAGILL.

Piqua, Ohio.

[This idea is good. The only objection I see is that the hinges would be too expensive, and the screws would be liable to work loose under the influence of the weather. It would have the merit that it could be folded up out of the way easily to let the lawn-mower run by; and whenever one is ready to move bees, or robbing may have got started, the entrance could be closed in a few seconds.—ED.]

QUEENS IN THE AIR BECOMING ACQUAINTED WITH STRANGE BEES AND FOLLOWING THEM HOME.

Let me help you explain why W. G. Hutchinson's queen returned—see page 371. Something over a year ago I wrote you about some observations of ours—myself and son—to the effect that bees will, when first made queenless, fly the country over searching for their queen; and should they find one seeking a home the two will undoubtedly become friendly in the open air, and the bees pilot or escort this queen to their home, and she will be accepted. Now, my theory is that, when those bees missed W. G. H.'s queen, they supposed her to be lost in the field, and they, being familiar with the field, proceeded to hunt her and pilot her home.

You or any one else can easily prove this theory, or whatever you may call it, and I feel quite sure that it will help to solve many of our disappearances of queens, and also explain why some, apparently hopelessly queenless, refuse to accept what we offer them in the way of a queen.

FROZEN BEES.

Now, Mr. Editor, allow me to say a word to you about bees freezing and then starving. Some five or six years ago, when soft maples were in bloom the bees were just rolling in pollen in the forenoon; but in the afternoon a hailstorm passed near us, and a chilly wind caught many of my bees out. The yard near the hives was thick with bees with great loads of pollen on their legs. This I had no opportunity of observing until the next day. My boys and I picked up several, and carried them into the house, when, lo and behold! they revived and were as lively as any. We afterward picked up more than a quart, and nearly every one revived. They were given to a weak colony after a day or two, and accepted all right.

About two years ago a similar occurrence took place, except that a snowstorm caught the bees out, very many took refuge on the side of trees opposite the snow, one side of the tree being white with snow and the other pretty full of bees with many in the snow on the ground. They remained out over night. The next day was quite warm, and I know that many of those on the trees got safely home, and I think nearly all of them; but those on the ground, especially those wet with snow, were "all in," while some, no doubt, from the ground reached home.

J. Warren Arthur.

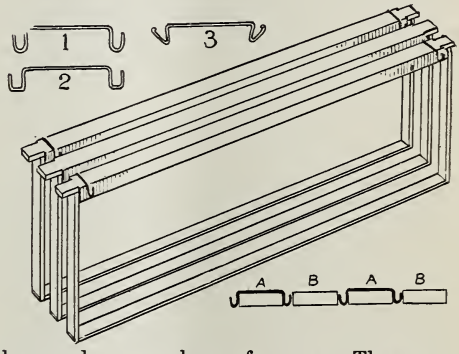
Springfield, Ohio, April 10.

[I really do not see how you are going to prove your theory so easily as you suggest. You may see the bees flying around in the air, but how are you going to *prove* that they are hunting around after a queen? and even if you should see a queen coming along with three or four or a dozen bees, how are you going to *prove* that these are coaxing her into their hive?

Regarding the frozen bees, I think you would have found they would have revived if they had been kept in that condition for several days, though perhaps they would have had less vitality afterward.—Ed.]

A WIRE FRAME-SPACER.

I send you a sample of my frame-spacer. It can be made of round steel wire or flat steel, about $\frac{1}{8}$ wide. I made eight for an eight-frame hive, and one extra to send you, all from baling wire. Hang it over the top-bars, one on each end of every other frame; or one to a frame, hung one on one end and the next on the opposite end of the next frame, etc. In fact, it may



be used a number of ways. These are better than Hoffman spacers, better than staples or nails, for they can easily be removed for extracting, and as easily and quickly put on. They don't give the bees a chance to propolize the frames a particle; can be easily taken off so as to allow the frames to be crowded together if necessary, without taking out the division-board. Finally, they are cheap. W. H. Lewis.

New Westminster, B. C.

[These wire spacers are very simple and cheap, but it would be difficult to hold them in place in shoving the frames in and out of the brood-nest. It would not be practicable to put spacers on every *other* frame, but it might do to use one spacer on one end of each frame provided you could make them hold their place.—Ed.]

USE OF BURLAP; IN-BREEDING, ETC.

Would it be best to put clean burlap under the cover next to the brood-frames?

I do not wish much increase, so how can I best prevent swarming and save time in the busy season?

As this is a damp climate would it be likely to help matters to renew brood foundation every four or five years? If so, how would you do it?

What is meant by full sheets of foundation in supers? T. Morris.

Rainier, Oregon.

[With the ordinary modern hives I would not use burlap nor any thing else under the cover. By "modern hives" I mean those that have a cover that is flat on the under

side, and bee-spaced about $\frac{5}{16}$ inch from the frames beneath.

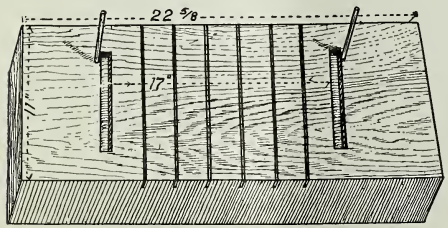
To prevent swarming we would respectfully recommend the shake or brushed plan, the Sibbald plan, as recently given in these columns, or the one recommended by Mr. E. W. Alexander on p. 425. Without knowing more of the conditions we could not advise you as to which one would suit you best.

A damp climate can have no effect on the combs or foundation. It is bad economy to melt up good combs and put foundation in their place every four or five years.

By "full sheets" is meant those that fill out the frame from end-bar to end-bar, and from top-bar to within $\frac{1}{4}$ inch of the bottom-bar. By "starters" we mean narrow strips of foundation reaching the inside length of the top-bar on the under side, and anywhere from $\frac{1}{2}$ to 2 or 3 in. wide.—ED.]

SOME IDEAS FOR SIMPLIFYING TRANSFERRING A TRANSFERRING-BOARD.

I send you a model of my transferring-board. When the cross-cuts, one inch apart, are filled with wires or strings the board is loaded for business. The frame is placed on the board with spacers in the insets and the pin at each upper corner comes just under the projection of the top-bar. A small cleat would do just as well to prevent the frame from sliding to you when pulling up the string or wire. I fasten these strings to tacks placed on top of the top-bar in the upper corner of the same, handy to put in and also to take out when the comb has been made fast by the bees. Cut the combs to fit the frames as suits you best. Apply the wire or string that lies just where you want it; fill up where you have used them out, and continue. There is no dropping-out of combs or pieces, no sliding of strings or



wires under frames, and scraping off innocent heads—no scraping off fat honey-caps. If caps are too fat they should be shaved down or the chunk of honey not framed, but fed in some other way if needed. If wires are used, and they seem kinky, just put a small nail at each end of each cut, and snub the wires lightly so they will stay until they are wanted.

This idea may not be new to all, but is to me, and is my own notion, and helps out greatly. It can also be turned over and fixed for wiring foundation into frames.

Why not make some shallow trays to receive combs and wiring-board in transferring, and line them with paroid or something similar, and have one larger and heavier to contain the box hive while you are abusing it? These would favor a complete and speedy clean-up, and perhaps less robbing. Honey sometimes flows freely in operating, with us, and these trays could easily be washed, or licked up by the bees as might seem best. I hope these ideas may be of use to you and my fellow bee-keepers.

RICHARD SIMMONS.

Sylvania, Pa., April 4, 1905.

[Generally speaking it is not advisable to transfer small pieces of comb unless they contain brood. The line of union results afterward in more or less drone-cells, irregular cells, and the comb will always have a patchy appearance. While looks count for nothing, yet the comb capacity is liable to be affected for the reason that there will probably be holes and irregular margins where the two pieces of comb are united. Unless there is brood in the combs I would transfer into standard frames none that were not large enough to fill the entire frame, or large enough to fill half of one so that only two pieces would be required. If these were fitted snug, no strings, wires, or strips of wood would be needed. Even where small pieces of brood have to be used, the combs containing them should be cut out after the brood is hatched, and a sheet of foundation inserted in its stead. It is a bad practice to use any thing in a yard but perfect all-worker combs.

The device above shown for inserting wires or strings where such must be used is very good. I think something similar has been suggested before.

Shallow transferring-trays, especially if there is very much honey in the combs, are almost a matter of necessity.—ED.]

THE INVESTIGATION OF THE STATE OF BEES WHEN FROZEN.

I am pleased to note that you intend to investigate further the matter of freezing, page 354. There are two important points which I think of, yet to be determined.

1. How long can bees remain in a frozen condition without noticeable injury?

2. How much cold can they stand? for I suppose the limit would be found somewhere, and we ought to know whether such limit is at all in reach of climatic conditions. This point might be ascertained by using liquid air instead of ice for experiments.

Referring to pages 303 and 353, let me say that I do not know whether Mr. Abbott and I are of the same opinion or not. His statements as quoted in GLEANINGS are not explicit enough for me to be sure that I understand him. We may notice that both the editor and Dr. Miller qualify their statements in regard to his theory in much the same way. One difficulty is that he starts with the hypothesis that the bees in question are dead. Now, if he is talking about dead bees it does not matter much whether

they came to their death by freezing or starving. But when the bees are alive, capable of enjoying good health, and of doing a fairly good summer's work, and yet seem to be dead just because they are frozen at a temperature of zero or thereabout, it is important to know that they are alive, especially since they require assistance to remain so. WM. A. STEWART.

Elkin, Pa.

[As, perhaps, Mr. Abbott's position has not been made entirely clear on this freezing question I have thought best to quote an editorial from his paper, the *Modern Farmer and Busy Bee*, under date of February, 1905, and here is is:

Dr. Miller requests in *Gleanings* that the editor of the *Modern Farmer* tell him how many bees it requires for them not to freeze in the winter. A normal colony, doctor, such a colony as one would expect to come safely through the winter in a cellar. There is no use of hair-splitting about one bee, two bees, or how many bees. Bees enough to make a normal colony, as many bees as one would expect to winter safely under other conditions, will get through the winter all right if they have plenty of honey, or, better, a sugar-cake, directly above the cluster, and are properly protected with a store-box, or something of that kind, to keep out the wind and prevent the sudden changes, and danger of bees being chilled before cluster forms. A full colony of bees formed in a cluster for winter does not freeze. They starve if they do not have plenty to eat in the right place.

We intend to test the proposition enunciated in 1 and 2, this summer, by putting some bees between cakes of ice.—ED.]

FOUL BROOD NEAR; WHAT IS TO BE DONE?

I have about 50 stands of bees, and foul brood has broken out about one mile from me; in fact, nearly all the bees for 20 miles down the valley are dead or have the disease. I don't think my bees have it yet, as I have looked and can't find it in any of the hives. What would you advise me to do? We have now no law in regard to foul brood in this Territory. Is there any preventive I can use? Can the frames and hives be used again? I have read a good deal in GLEANINGS in regard to the disease, but I don't understand it.

Cedar Hill, New Mex. W. C. MAY.

[A most excellent preventive against the inroads of foul brood is to practice shake or brushed swarming, putting the bees on frames of foundation. In the fall, if it is necessary to feed syrup or honey put in a small quantity of naphthol beta, which is a foul-brood germicide.

During a dearth of honey it would be advisable for you to look the combs over pretty carefully every ten days to see if any foul brood starts. You need have no fear so long as honey is coming in.—ED.]

TWENTY BALLED QUEENS IN A CLUSTER.

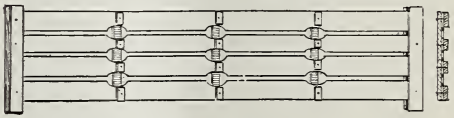
I ran up against a proposition the other day, and it is this: I called on a neighbor bee-keeper, and he had just found a stock of bees on the outside of a hive in his apiary, acting as if swarming. He found twenty queens in the cluster, and all balled. He had just got them caged when I called. All of them looked like laying queens. I can find nothing in the A B C book nor in Langstroth on the Honey-bee, touching this matter, and I am at a loss to account for it. He hadn't missed any bees from other hives, and they don't start swarming till about the first of June in this locality. Possibly you can explain it to me. M. TOWNSEND.

Ontario, Oregon.

[I should question very much whether the queens found in balls were laying ones. It would seem like a case of an after-swarm that had taken with it several virgins. After flying about in the air for some time the bees attempted to go into a hive already containing bees. This would result in a free fight, and probably the loss of all the queens. Even the bees of the swarm might take a hand at the balling business after they had got stirred up.—ED.]

A FREE-PASSAGE FENCE.

I send you by mail a sample of the kind of fence which I have been using for two years, which seems to give freer lateral



communication than the ordinary fence. I know it said there is nothing new, but I have never seen or heard of any thing like it. A. M. V. HAGER.

Athol, Mass.

[We have had numerous models like the sample here illustrated submitted to us in the last three or four years. Theoretically they have the merit of allowing the bees to pass back and forth over the surface of the sections, making a more even filling. But the trouble with the fence here shown, and many others like them, is that they are too expensive to make. No bee-keeper would be willing to pay what a factory would have to charge to make fences like the sample shown; and it is very doubtful whether the comb honey produced with such fences would be any better filled than that produced between ordinary standard fences. The best free-passageway fence I know of is the Hyde-Scholl. Quite a number who have used them have reported that they secured better filling of the comb. While this is more expensive than the standard all-wood fence it would not cost as much as the one here shown.—ED.]

SENSE OF SMELL IN BEES; WHY THEY CAN FIND THEIR WAY BACK TO THE HIVES.

I notice the remarks of J. W. Porter, in the April 15th issue. He says, "If honeycomb be burned in a manner that the smoke from the burning comb can not be seen, how do bees recognize the fact? Why, by the same sense we use when we perceive

the odor of cabbage or burnt rags in the kitchen, although there may not be any smoke. He says, also, "How do young bees find their way back to their hives when taken away a short distance?" I should say they were guided by their bump of locality or direction. A pig can find its way back when taken from home, and so can horses, dogs, and other animals. When young bees are moved they must be conscious of the direction they are taking. If they find their way back by scent then they display a greater sense of smell than old bees; for it is well known that, when a hive is moved only a short distance from its old stand, the absent bees coming from the fields can not find it. I do not know for a fact that young bees *can* find their way back. I have observed young bees just from the cells crawling in unchallenged at the entrance of neighboring hives, and wondered if young bees have not, like drones, free access to any hive.

ARTHUR T. GOLDSBOROUGH.

Wesley Height, Washington, D. C.

[You quite effectually dispose of the smell theory on the part of your bees in locating their hives when you say that the old bees (which is a fact) will not be able to find their entrance if the hive is moved a short distance. By "short distance" I mean 20 or 30 feet or more. I see no reason why the sense of smell should be any more acute in young bees than in old ones. Indeed, it is not definitely proved yet that young bees will find their own entrance.

Yes, it is a well-established fact that baby bees, like drones, will be accepted at any entrance.—ED.]

HOW TO ARRANGE A LEWIS FOUNDATION-FASTENER FOR FASTENING IN BOTTOM STARTERS, AND CUTTING FOUNDATION.

First take out the hot plate and grind or file the end to a thin sharp edge. Next, lower the block on which the sections rest to a position about $\frac{5}{8}$ of an inch below the hot plate, so that, when a large piece of foundation has been fastened to the bottom of the section, the sharp edge of the hot plate may be brought slowly forward, cutting off all of the foundation except a stump about half an inch wide, which is the bottom starter. Invert the section on the machine and fasten the rest of the foundation, or that part left after the bottom starter has been set, and the work is done.

When I cut my foundation I take a board as long and as wide as the sheets of surplus foundation, and rule it off with a pencil to cut five starters to a sheet, making the rulings as much triangular as five to the sheet will allow. Draw lines from the rulings on either side of the board, and the pattern-board is ready.

Lay one, two, or three sheets of foundation on the pattern and the marks will show through enough to cut by. I use an old kitchen chopping-knife, such as our mothers used for chopping meat for hash, etc. This knife is kept hot by hanging on a hook just above the hot plate of foundation-fastener. In cutting, the knife is rocked back and forth over the rulings on the pattern-board. The children do most of the cutting, and stack them up in neat piles.

I have a hopper made of lath, holding, when full, 1500 sections at a time, which, with its inclining floor, feeds the last section down within easy reach of the operator.

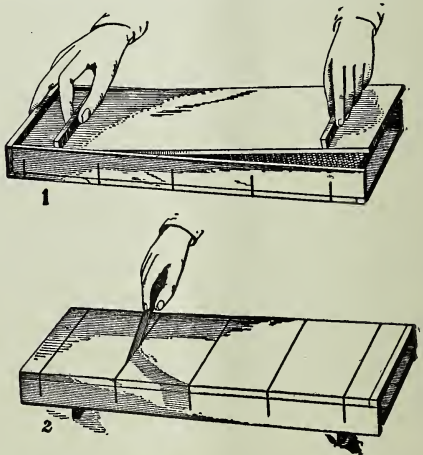
The sections, when ready, are disposed of by putting directly into supers when they are emptied, otherwise they are put into crates near by.

F. W. HALL.

Hull, Ia., Feb. 9.

[Although Mr. Hall has made use of the Lewis fastener, we suppose that any of the machines using a hot plate could be adapted to his method by a little change.

If we understand him correctly, in order to put on bottom starters as well as the upper large piece, he first fastens the large sheet in the ordinary way, then runs out the hot plate, slowly, to cut off all except the narrow stub for the bottom starter, and finally reverses the section, fastening the remaining large piece of foundation as usual. He may have some good reason for cutting the foundation with the hot plate, but we do not see why this narrow piece could not have been cut with a knife on some such arrangement as his cutting-board, and then the two could be fastened separately, in the ordinary way, by simply reversing the section, after the first piece is in, and put in the second one. It seems to us that this latter method would be quicker; but, even if it were not, it would save the expense of changing the construction of the machine.



For cutting foundation into starters or full sheets, we consider the miter-box, as shown, ahead of any thing else we have tried. Any one can make such a device, or they can be obtained from any of the dealers. The general principle of this method will be apparent from the illustrations.

Place the box on a table, with the saw-cuts down, as in Fig. 1, and lay in five to twenty sheets with the ends even. Then put on the cleated board and turn the box over so it rests on the cleats as shown in Fig. 2. A circular knife, free to turn easily on a handle, is the best for cutting; but a keen butcher-knife will do about as well. It need not be hot if it is well lubricated with soapy water. Hold the knife at an angle, as shown, and move it rapidly but lightly back and forth, cutting only on the stroke toward you.

The illustration shows the box adapted for full sheets; but by putting the saw-cuts closer together, starters of any width can be cut. They could also be arranged for triangular or odd-shaped starters. With one of these boxes 150 full sheets may be easily cut in one minute; or, if starters are wanted, as many as two or three hundred. The work requires no care, and a mistake can not be made.—ED.]

GROCER MENTIONED IN FEB. 1ST GLEANINGS NOT IGNORANT OF THE FACTS; SIMPLY WROTE TO SECURE PROOF TO USE IN CONVINCING CUSTOMERS.

Regarding my letter to Mr. Pouder, on which you comment in Feb. 1st GLEANINGS, I will say that I had no misapprehension whatever on the subject of manufactured honey when I wrote that letter, which was only one of several letters written to other parties at the same time, one of them being published with a column answer in *The Modern Grocer*, of Chicago, of Nov. 19, 1904. I wrote in the way I did to secure proof of the genuineness of comb honey for the benefit of all my customers, particularly the family of Dr. C. N. Brown, of this city, who claimed to *know positively* that comb honey is manufactured, and nothing I could say would convince them. My method of writing secured fuller and more numerous replies than could have been obtained in any other way, and no one has read them without being convinced absolutely. However, the opinion is all but universal that comb honey is manufactured, and nothing less than a special presidential message on the subject will enlighten the majority of people for a generation at least.

Fairmount, Ind, Apr. 1. C. A. COOK.

[You are exactly right. The opinion is all but universal that comb honey is manufactured, and it is high time that bee-keepers were helping to disabuse the public of that erroneous notion. At present the new Honey-producers' League offers the best solution of the difficulty.—ED.]

BEES IN THE CELLAR WITH CHICKEN-INCUBATORS.

I am a subscriber for GLEANINGS, and have been much interested in the different discussions in regard to wintering bees in a cellar. I put five colonies in my cellar about Dec. 1, and, having two incubators in the cellar, I was very anxious to know the outcome of the combination. The cellar was a moderately cold one, as some potatoes froze in one corner behind the bees and under one of the ventilators. My bees seemed not to notice the incubators until the warm weather in March, at that time I gave them their first flight; but they did not quiet down when I put them back. The continued warm weather and the incubators kept them in an uproar so they came out for good two weeks later. WALTER DEGRAW.

Springfield, O., April 16.

[Bees and chicken-incubators in the cellar would make a bad combination. The incubators would be doing their heaviest work just at the time the bees would be getting uneasy, and when it would be difficult to keep the cellar cool. In this case you had better have left the bees out without putting them back.—ED.]

SCATTERED EGGS.

In one of my hives I found, when opening it, two and three eggs in a cell. These eggs were scattered all over the comb. What is the cause of it, and would it do to keep the queen? M. D. WHITCHER.

Los Olivos, Cal., March 22.

[Scattered eggs might be either the work of laying workers or of a drone-layer. Or they might be the work of a queen just received from the mails, and which had not begun to lay regularly. The cases of a fertile queen scattering eggs in this way, however, are very rare; and when we find this condition we may look for either a drone-layer or laying workers.—ED.]

MORE MODIFICATIONS ON THE SIBBALD NON-SWARMING PLAN.

I thought, as I am getting somewhat interested in your literature, I should give you my experience in regard to divided swarms in preference to "shook" swarms, and have tried it two ways—first, to place hive No. 2 in place of No. 1, then remove one card of brood, together with queen, to hive No. 2; then remove No. 1 some distance away in the apiary; and as the field bees return they will come back to the old stand, or hive No. 2, and by night one will have a nice large swarm in No. 2. Sometimes it drains No. 1 too heavily, and in this case place a super from No. 1 on No. 2.

Second, remove No. 1 from its stand and place No. 2, then remove one (or two cards of brood is better) with queen-cell. Be sure not to get the queen, and place in No. 2; then remove No. 1 some distance away. It works well to remove the super also. This latter plan has in all cases proved the most successful, in my estimation at least.

I have one colony of this latter kind treated in this way already, this spring. I had one colony die out, all but the queen and about 50 bees. I put this queen and her bees in a cage and placed her in a hive with comb and honey, then took one comb of

brood from another very strong colony, and placed it in the same hive, then placed this hive in place of a strong swarm, and removed No. 1 about four feet. It seems thus far to be all right. Both colonies are doing finely. The field bees accepted their new queen all right. H. O. SWARTZ.

Schoolcraft, Mich., April 22.

A BEE-KEEPER FOR EIGHTY-FOUR YEARS.

I shall be 87 years old the 16th of May, and have been in the bee business ever since I was four years old. My father kept bees. We lived on the east shore of Lake Champlain. At the age of four years I was on the south side of our house, and a swarm of bees came and alighted on a tree near by. I went into the house and told my mother I had found a swarm of bees. My uncle cut the tree down, and my father hived them. I have kept bees during my life to the present time. I sold in two years' time enough bees and hives to amount to $570.

ENOS ASELTINE.

Swanton, Vt., April 17, 1905.

CONTROLLING SWARMING, AND PREVENTING INCREASE.

In looking over the article in GLEANINGS of April 1, p. 353, describing H. G. Sibbald's method of controlling without shaking or allowing natural swarms, I thought I should like to give my plan of handling swarms without much increase.

When a natural swarm comes off with a queen I want to keep over, I take the swarm on two combs and some full sheets of foundation and starters. Set it on the old stand, and put on the super from the old hive, if any, with a queen-excluder, after turning the old hive around. Then shake all the bees in front of the swarm from the combs of the old hive, and distribute the brood among the weaker colonies. By so doing, before the honey-flow I get my bees in good shape so that I can get my reward.

JOHN BAILEY, SR.

Bracebridge, Ont., April 10.

[The plan that you describe for controlling increase is a standard orthodox one—so good, indeed, that many bee-keepers practice it in preference to all other methods.—ED.]

CARRYING COLONIES ON A STRETCHER.

I took 73 colonies from cellar, and placed them on summer stands, on the evening of March 28. Wintered without loss, all in good condition. I carried them 300 feet, and was 1½ hours in completing the job, including the contracting of entrances. I carried them on two stretchers, three hives on each, with two men to a stretcher.

Syracuse, N. Y., Mar. 29. H. C. MILLS.

[We have tested various methods of carrying bees out of the cellar—two or three hives on a stretcher—but we prefer to carry one hive at a time, and one man to a hive. When two are carrying a load between them they must keep in exact step—something which it is a little difficult to do over rough ground at times. Then the man at the rear can not see where he is stepping.—ED.]

HOW TO CONTROL INCREASE.

I have about 25 stands of bees, and I do not feel able to buy the hives to take care of all the swarms. Last season I lost a great many swarms on account of not having hives. I wish you would please tell how to keep them from swarming. Will the excluders keep them from swarming, and at the same time allow them to work the same? Please give me size of sections that are mostly used. P. D. MCNEALLEY.

Taylorstown, Va., March 20.

[To control increase we would recommend to you recent articles referring to the Sibbald non-swarming method in these columns. Excluders will not keep bees from swarming. Entrance-guards or Alley traps having perforated metal will keep queens from going off with the swarm, and that is all. Sections most commonly in use are 4¼ ×4¼. The 4×5 are, however, rapidly gaining favor in many markets.—ED.]

PUTTING UP HONEY FOR LOCAL CUSTOMERS, IN STONE JARS.

Mr. Root:—As you wanted to hear from some others in regard to putting up extracted honey by the E. D. Townsend method, in April 1st GLEANINGS, I will say that I have customers who come to me in extracting time, bringing with them stone jars for me to fill. They tie up those jars in fine shape, and set them away to grain solid. After letting them stand for two or three years they melt the honey as fast as they want to use it.

I guess there is something in location and variety to think of, in putting up extracted honey. S. F. MILLER.

North Manchester, Ind.

Will it do to rear queens and have them mated from drones of the same hive?

Harper, Iowa. JOHN HAUPERT.

[Yes; and if you desire to develop some desirable trait or quality in the bees you will be compelled to in-breed; then by selection pick out individual queens that will show the desirable traits in the greatest and largest predominance. It is not practicable to in-breed to a great extent with bees unless there is only one colony in a radius of three or four miles; and even then the queens and drones might fly further; for the tendency of virgins and drones is to fly away from the home yard in order that the breeds may be crossed, for nature seems to work along these lines. While in-breeding accentuates and develops desirable traits as nothing else can do, it is liable to develop weaknesses, such as a lack of vigor in the resulting stock.—ED.]

Quench not the Spirit.—II. THESS. 5:19.

Again and again through life I am reminded of the fact that the human family, like the bees in a hive, are to work together. Not only are neighbors to be neighborly, just as the bees in the same hive are neighborly, but God's plan was that all *ages* should be neighborly. The very best work can be done where the old and young work together. Dr. Olsen's joke has pretty well gone by, and I think we are all, perhaps, a little better satisfied with things as they are, since he has made this stir. To banish from the busy traffic of life all men over 40, or, if you choose, over 60, would be almost as bad as to talk about banishing those under 40, or, if you choose, under 20. Huber is 21, and Ernest is 42; and to keep it up arithmetically I ought to be 63 instead of 65. Well, when we three tackle some business proposition we usually handle it; and if it is a tough one we call in the two sons-in-law; and for *some purposes* we often find it a pretty good plan to call in the *women folks* for counsel. Now, that is not all. There are several grandchildren who are beginning to have quite an eye (and head too) for the problems of this life.

Well, what I started out to say was not exactly that we are all needed of all *ages*, but also that there is great need of perfect harmony. This is all true; but there is still another thing true. The grandmothers and grandfathers should all through life recognize they are constantly setting examples; and in even a model family there is a great likelihood that the younger ones will be "chips of the old block." The children and grandchildren with all present advantages and improvements should be expected, as a rule, to outstrip the older ones. But even if this be true they are very likely to copy not only their good qualities but bad ones as well.

A few days ago Huber was cleaning up our automobile. It is getting to be springtime, and it is rather difficult to keep the machine looking as neat and tidy as Mrs. Root would have it. Besides, I expected to take it in the afternoon to a Congregational conference in another part of the county. Huber had the machine out under one of the apple-trees where he could work on the grass; and Leland, our fourteen-year-old grandson, was helping. When I looked at my watch I remarked it was after schooltime; but he said, by way of explanation, he was not feeling very well that morning and his mother said he need not go to school. I did not say any thing, for I recognized how exceedingly boylike it was to feel well enough to work out under an apple-tree in May, especially at a nice piece of machinery, while he did not feel well enough to go to school. I guess one reason why I did not say any thing was because I remembered it was very much like my own self, especially during my early years. Of course, when one gets to be 65, and is deacon of a church besides, he is not expected to let his feelings influence his conduct exactly as a boy's do. The machine was all in nice trim, and for the first time this season I started out for a "gallop" across the country. The barometer said rain, and the Weather Bureau said rain, and Mrs. Root worried about my starting out, especially as the country roads were very hubby, with bad mudholes now and then which I knew would be found. When I got out in the country amid the green fields, budding orchards, and occasionally a cherry-tree in full bloom, I began to fell the inspiration. It almost seemed as if the *machine* also felt glad to get out into the country once more. Although this is the third summer I have had it, it seemed as if it never worked so well before. When I had made about half the trip of ten miles it began to rain; but the roads were so rough, and there were so many deep mudholes (so deep, in fact, that if I got into one of them the machinery would strike the ground) I found it difficult to make very much speed in the rain unless I pushed ahead a little recklessly. As I had on my rain-proof overcoat and my usual fur cap I reasoned that the rain would not do much harm until the roads got so wet as to be slippery. This would make it dangerous; so I put on the power, hoping to reach town before the roads became so wet as to slip. The little machine just bounded over the rough places. Some of the time it made me feel as if I were in very truth aboard of that flying-machine. We jumped and bounded until I could scarcely keep my seat, and it seemed as if the wheels touched the ground only now and then.* I have become so accustomed to the guiding-lever that I found I could keep the wheels on a very narrow ridge between two deep ruts without getting into either of them.

I came into the little town of Chatham all

* Some of you may say, "Yes, that is all very well so far as *you* are concerned, putting that machine up to high speed and making it jump so that the wheels hit the rough roads only a part of the time. But how about the unlucky people who might happen to be driving horses on the same road? No doubt you enjoyed the spring air in the month of May that gave you inspiration, etc.; but was it really the kind of inspiration a Christian should indulge in?"

My reply is, while driving so fast I did not meet any vehicle of any kind. Had any come in sight, of course I would have slowed up. Once just before the rain, when I was on a bad piece of road I caught sight of a farmer and his wife coming toward me. When quite a piece off they stopped and the woman began to get out. I at once ran my machine off the beaten track, went forward to meet them, and told them I was very sorry indeed to cause them the least bit of trouble. Then I took one of the horses by the head and led them past the auto. They scarcely noticed it, and then the woman began to apologize for having made me trouble. Then her husband said, "Mr. Root, if I had known that it was *you* I would not have worried; and if the fellows who run these machines were as careful and as anxious to avoid giving anybody trouble we should have nothing to complain of. But I supposed you would smash right ahead just as they usually do; and with these deep ditches on each side of the road I thought it was safest to have my wife get out. We are very much obliged to you for the trouble you have taken not to hinder or annoy us."

right, with the blood of health tingling to my fingers' ends. I suppose you know it is true that I have all my life delighted in riding hobbies; and *sometimes* it is not at all to my taste to get off from my hobby and attend to duty; and it was so in this case; for when the shower blew over I felt as if I would rather ride that automobile the rest of the afternoon then to attend to any *sort* of conference.

The papers presented were excellent, but I found it difficult to hold my mind down to the business in question. There was a great temptation to keep thinking of the trips through the country I was going to make soon. Another thing, although there was a pretty good-sized audience the windows were not kept open to let in fresh air, and so, of course, I began to feel dull and stupid. I had planned going home in the night after the evening session, and going back next morning before the opening of the second day; but when I came to go over the road, and saw the number of deep holes that one might get into I knew night travel was out of the question. By *omitting* the evening session I could go home by daylight and return by daylight in the morning, and thus enjoy two ten-mile rides. Then my conscience began asking me what excuse I had for being absent in the evening. I was one of the delegates appointed by our church, and was expected to make a report of the proceedings. Just a few hours before, I was inclined to criticise my grandson who did not feel well enough to go to school; and what had I been planning as an excuse for being absent in the evening? First, I could tell those present, who might object, that I had important business at home. This was true to some extent; but the *whole* truth was that the younger members had charge of the "important business," and I was *not* particularly needed. Then before I knew it I was trying to persuade myself that I did not feel well, and there was a little truth in that. I did not feel *quite* as well as I did when I was riding that auto to escape the raindrops; but to say I did not feel well enough to be present during the evening would be a rather large exaggeration. Then Satan made up a lot of other excuses. Do you think I make a mistake in ascribing it to Satan? Not a bit of it, friends. He is opposed to religious meetings of every kind; in fact, he will wax eloquent on the theme if you give him the least bit of encouragement or listen to him at all. One of his "ear-marks" is that he is *every time* and *always* opposed to God's holy word, to all gatherings of church people, and to every thing that bids us be consistent and honest, and true to the dictates of our conscience. I finally said, "Get thee behind me, Satan."

One great reason why I did *not* "feel well" was that I had not planned for my noonday nap; and the close air in the audience room made me feel quite badly for a time. Pretty soon, however, we had a recess, and the windows were opened so wide that we had an abundance of cool air. Right after supper I got permission to swing a lounge right before an open window (in a pretty little home) so as to get the nap I should have had right after dinner.* Sometimes I omit these afternoon naps because I dislike to annoy people; but the half-hour of sleep that I got with the cooling breezes after the summer shower coming in at that open window was worth to me—well, I can not say how much. We older people have no right to deprive these bodies of ours—these God-given bodies—of the rest they require to enable us to do our best. For many long years I thought I had not *time* for an afternoon nap; but I have discovered it is a great saving of time. One hour after the refreshing sleep is not only worth two without it, but it enables me to do things I could not have done without being rested up.

I enjoyed the evening session immensely. I would not have missed it for any thing: and one of the papers presented there I expect to give on these pages very soon. Of course, I had a part on the program, and several things contributed to make me feel nervous about it. For instance, it is exceedingly embarrassing to me to be obliged to make an audience wait. Yes, if I ask them to wait until I turn over the leaves of my Bible and find my text I am sure to become flustered, and perhaps can not find the text at all, even when it is right before my eyes. Accordingly, I usually manage so as to have the Bible open at the right place, or have marks in the book if I want several texts, and then make a pencil-mark around the text I want to use. At this session, when it came time for me to give my talk I discovered the good brother who led the meeting had laid the big Bible under the table on the floor because there was not room for all their papers on the little table. Now, I suppose most of you will laugh at me when I tell you that I worried a good deal because I feared getting the Bible off the floor, and finding the right place, would get my carefully planned talk all out of my head. It troubled me so much that I prayed very earnestly that the Holy Spirit might help and sustain me, and enable me to speak as I ought to speak and wanted to speak. And herein comes one of those wonderful (to me) answers to prayer. Now please take in the situation. An hour or two before, I had been meditating some excuse to get away from the conference. Why, I was actually a good deal like Jonah when the Lord told him to go to Nineveh. May the Lord be praised that I put away the temptation, and went straight to Nineveh where God wanted me. Then, instead of making excuses, and prevaricating, the Holy Spirit directed me to tell the plain honest truth; if I felt embarrassed and troubled, to be frank in the outset, and not try to conceal it. So my opening address was, as nearly as I can remember, something as follows:

*After having had that restful nap by the open window I took some of the little girls around town for a ride, and finally gave the woman and her baby a little ride, who was so kind as to give me a nice place to sleep.

"Dear friends, I have been asked to talk to you on the subject of religion and business. Well, if I were going to talk to any of you on business I should want to get up close to you. If it were *important* business I should want to sit down by your side. If I were also going to talk to you about spiritual matters, the worth of your own soul, I should most *assuredly* want you close beside me. But the fact is, you are away off at the further corners of a large church, and I am pretty close to another corner. I am not a minister of the gospel, and I am not an orator; but I have prayed that I might be able to do you some good; but I am sure I can not do it unless you come up close to me and occupy these vacant front seats."

The honest truth seemed to have touched the spot. The audience rose almost *en masse;* and when they placed themselves close around me I saw by their smiling faces that I had won their attention and their sympathies. Then after I thanked them I said:

"One thing that greatly relieves my embarrassment in speaking to this body of ministers and other intelligent people is the presence right back of me of my old friend—one who has been a *good* friend ever since my boyhood—the Rev. Chauncey N. Pond; and I want Bro. Pond to help me make my talk."

Bro. Pond responded quite promptly, "All right, Bro. Root. Tell me what you want me to do and I will do it with great pleasure."

"Well, Bro. Pond, I want you to get that blessed old Bible out from under the table, and then I want to have you hunt up the 26th verse of the 20th chapter of Matthew." I knew Bro. Pond could find it readily, for he had stayed at our house the night before, and we talked about it at the breakfast-table. I asked him to make a pencil-mark at each side of that 26th verse so my eye could catch it quickly, when I got at the point of my story where I wanted to use it. I will not give the rest of my talk here; in fact, I gave you a large part of it on page 510 of our last issue. The point I made was that the farmer, the grocer, and the consumer were not the only ones in that transaction, wanting the best of the profit or all of it, if they could get it; but in the great affairs of our State and nation, the trusts, and everybody else for that matter, seem to want the "whole earth." They want the best places and the best positions. But Jesus said, in summing up this very thing, in speaking to his disciples, "But it shall not be so among you." His followers were to do things differently. They were to live with different aims and objects in life. They were to love their neighbors as themselves.

Then I continued about as follows:

"If the farmer who raises the potatoes, the grocer who sells them, the man (or woman) who orders potatoes from the grocery, are all followers of the Lord Jesus Christ they should do business differently. When the middleman found that the farmer had a hundred or more bushels in his cellar that he could not sell, he should have said to him something like this: 'Look here, John. I do not want to see you lose those potatoes, and I will do my very best to help you out. Even though the potatoes I have in my cellar did cost me 28 or 30 cents I will sell them at less than cost if necessary.' Then this Christian grocer (yes, there are such in the world) should tell the man who drives his delivery-wagon to explain to all his customers that he was going to try to help the farmers sell their potatoes, and that if they would buy a bushel at a time, and let him deliver them at his convenience, he would make a very low price, say 20 or 25 cents. Then the man or woman who bought these potatoes, *and who belongs to the Lord Jesus Christ,* should turn in and help something after this fashion: 'It is really too bad, Mary, that these farmers are going to lose their potatoes, and will have to throw them away. Can't you use more of them in making bread than you have been doing? and we will all try to use more potatoes in the family than we have been in the habit of doing, just to help get rid of the surplus. If we all go at it in the right way we can, without doubt, prevent our good friends the farmers from suffering such a very heavy loss.' Now, friends, if everybody did business in that way—millionaires and railroad corporations, beef trusts, and all the way from the bottom up—what a beautiful world we should have! Would it not be almost a heaven here on earth? Think of the expenses in the way of litigation that would be saved just to make men fair and honest. Why, it fairly stretches one's imagination when he tries to contemplate a neighborhood or a community where there was nobody who wanted *all* the profit, no matter whether his neighbor suffered loss or not."

I do not know whether my little story has taught you any lessons, dear friends, but it has taught me one. When I contemplated for just a few minutes absenting myself from that evening session, Satan frightened me by pushing on with the chance he thought he had before him. Why, I was even tempted to say mentally something like this: "Well, I do not like conferences very well, any way. They never have their rooms ventilated so one can feel well, and they do not amount to very much after all. It is a great deal of trouble to drop business and every thing else, and get away at such a busy season of the year." Yes, when Satan went to such lengths as that sentence, it *frightened* me. After that experience I enjoyed the conference from beginning to end, and it was a deep spiritual joy, something that *abides* and *satisfies the soul.* The enjoyment that I obtained by running an automobile to get out of the summer shower was all right and honest; but when we let things of this kind tempt us to neglect serious and sacred duties, we are making a bad use of God's gifts. I not only enjoyed the conference from beginning to end, but I enjoyed giving a report of it to our home church; and I enjoyed particularly exhorting my listeners to make an extra effort to be on hand at our semi-annual conferences.

Had I yielded to that temptation to stay away it would have brought spiritual darkness, and it would have crippled these very Home papers. Do you see how *little* things may grieve away the Spirit, as in the language of our text?

"OF THE PEOPLE, BY THE PEOPLE, FOR THE PEOPLE."

Perhaps the above heading may look a little singular in the department of High-pressure Gardening; but I think it is right after all. On page 510, last issue, I said the farmers could not sell their potatoes in Traverse City because an ordinance had been passed forbidding them to peddle. I wondered at the time if that ordinance was going to stand. Just now the same thing is coming up in Cleveland. My opinion is that it is a concerted movement to benefit those who are interested in keeping up prices. We are told that supply and demand regulate the proper value of all commodities. If the grocers are getting too much profit, then the market-gardener and the consumer are both doubly interested in making a short cut without the aid of the middleman; and, most important of all, it is generally conceded that all the garden-stuff is ever so much better when it gets quickly from the ground on which it is grown to the consumer. Peas, green corn, string beans, etc., to be nice and have their full flavor should reach the good housewife the day the stuff is gathered. This can be accomplished to *some* extent by leaving the stuff at the groceries; but the gardener who makes daily rounds, or, say, every other day, can get acquainted with his customers, can learn their peculiar likes and dislikes, and can, without trouble, give just what they want and *when* they want it; and thus friendly relations may spring up and continue for years between the grower and consumer. Now, of course, these "trust" people (for it is nothing else) must trump up some excuse for stopping the farmer from coming to town with his vegetables. What do you suppose the excuse is? Why, that vegetables, etc., sold in the open air will collect bacteria, microbes, etc. My good friend, where do you suppose bacteria would be most likely to congregate—in the average grocery where such stuff is sold, or in the open air on the farmer's wagon, or in his stall where he brings his stuff before daylight, as a rule, and sells it all out before noon? Read the following, which I clip from the Cleveland *Leader:*

The arguments which Superintendent Schmidt presented on the question of the code relating to the sale of vegetables in the open were mainly in the direction of showing what hardship it would work upon the farmers who come into the city to sell their produce and to what extent it would affect the market business as it is now conducted.

"Which do you think would be preferable," asked Dr. McAfee, "to take a living away from a few families who come into the city to trade, or to take the lives of many of the people living in the city? The dust and dirt of the street blows on these things, and only cooking will kill the germs."

"An injustice is being done to people who pay rent," added President Ward. "I don't see any justice at all in allowing a handful of farmers to come into the city to spread out their stuff and gather bacteria. These things could be sold to grocers direct. However, we will look into the matter and take it up with the grocers' association."

Now, of course the majority should decide this as it does every thing else; and the producer and consumer, in a fair vote, would most assuredly outnumber those who are in favor of having all perishable products carried to the grocery; but I think you will find in this case, as well as some others, that the "bosses" do not propose to let the majority rule. The ordinance will be passed before the farmers have been even consulted. It will probably be just about like our temperance work. Our Brannock local-option law was to permit the majority to rule in keeping saloons out of residence districts; but the saloon-keepers say by actions, if not words, "The majority shall *not* rule. We are going to plant our saloons right around your homes, and in the midst of them, whether you like it or not." I do not know that they add, "Help yourselves if you can," but they would do it if they dared. And the saddest part of the whole thing is that the present Governor of Ohio is right in with the saloon-keepers and brewers, and the political bosses say that he shall have another term. Some of you may try to persuade me that I am mistaken, but I am not. I have followed this thing from beginning to end, and know all the crooks and turns. Now, then, fellow-countrymen, shall our bosses—these men who *hate* righteousness and *love* iniquity—decide these things for us, or shall this be a nation where the laws are made of the people, by the people, and for the people?

High-pressure gardening is a grand good thing; but it will not amount to very much if we do not occasionally transfer the "high pressure" to this matter of making and enforcing our laws. God helping us, we are going to make these "enemies of all righteousness" *feel* the pressure, and that right soon.

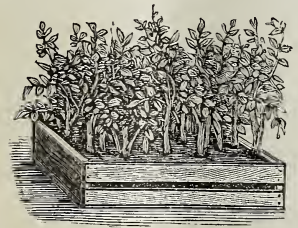
GROWING BASSWOODS FROM THE SEED.

Heigh-ho! we have got it. One of my expert young gardeners, Mr. Frank Ritter, made a visit to the magnificent grounds of Storrs & Harrison, of Painesville, O. While there he saw them cracking open the shells of canna seeds before they were planted. After asking some questions, and taking some of the canna seeds home, he not only succeeded in making them grow, but, by cracking off the hard shell of the basswood, he got a very good per cent of germination. The first plant that appeared was 17 days after sowing the seed in very rich old compost. It appears that this hard tough shell

is nature's provision so that the seed may remain in the ground several years and not lose its vitality. When the outer shell finally rots enough to let in moisture the seeds commence to sprout and grow; and that is the reason why, in my experiments, only a few of the basswood seeds germinated in one year, a few more the next, and so on. Alternate freezing and thawing will break the shell of a few of the seeds—that is, if they are on or near the surface. If deep down in the soil, or under a heavy coating of leaves, the vitality may be preserved for many years. We tried breaking the shells with boiling water, but did not succeed. At present we have no quick way of breaking the hard shell. So far I have been cracking them with a hammer, when spread out on a piece of stone flagging. They should be about half an inch deep, in good fibrous soil mixed with old well-rotted manure. Rotted sods, and manure such as florists use, is as good, perhaps, as any thing.

Now, friends, I hope some of you will run opposition to me and enjoy the work as well as I do, growing basswoods for timber and for honey.

While I write, our boys are taking up the little plants from under our basswood-trees, and setting them in trays like the one shown below. Each tray holds four rows of little trees, eight or nine trees in a row; so we estimate every three boxes will make 100.



PLANT-BOX $6\frac{1}{2}\times12\times3\frac{1}{2}$, TO HOLD 32 SEEDLING BASSWOOD-TREES.

We put an inch of old well-rotted manure in the bottom of each box; then about half an inch of potting-soil, and on this the seedling trees are placed, taking up each little plant with a lump of dirt attached—say a ball of earth an inch or more in diameter. After they are placed in the tray, some more potting-soil is put in between the plants, with a spoon, filling it up pretty nearly to the seed-leaves. We then set the boxes flat down on a piece of stone flagging, with a slight blow. This sets all solid. Now give the little boxes a sprinkling of water—just enough to soak the soil around the roots, and place them close together in the ground on the north side of some building. Put them just far enough away from the building so they will be entirely in the shade by the time they begin to wilt under the strong heat of the sun; and have it arranged so the heat of the sunshine will not strike them in the afternoon until they can bear its full rays without wilting. In this way you have automatic shading. When the plants begin to crowd in the boxes, take each one up with a spoon, going clear to the bottom of the box, getting manure and all. You can now set them in rows far enough apart for a horse to pull a cutivator between them. I would not put the rows nearer than three feet; and if your soil is as rich and strong as it ought to be they should not be nearer in the row than six inches. You can put them closer if you are crowded for room, but they should grow three feet tall the first season. Better give them room enough.

The above directions will answer for a great lot, not only of trees of different kinds, but tomatoes, celery, etc. If you want the basswoods to make a big growth, be sure not to let them suffer for water during a drouth. After the roots once get well down in the ground they will take care of themselves; but basswoods do best, as a rule, on rather wet or damp ground; but it should be sufficiently underdrained so there will never be any standing water.

WINTERGREEN BERRIES, ONCE MORE.

After dictating my story in the last issue I asked our subscription clerk if we had any subscribers at Merritt, Mich. She replied there was none on the list. Imagine my surprise, therefore, on finding the letter below on my table this morning:

Mr. A. I. Root—kind Sir:—My father takes GLEANINGS, and I see in it that you speak of a little boy at Merritt. Walhalla is what was formerly Merritt. The postoffice was formerly Manistee Junction. I am the little boy who sold you the berries. My name is Louie Bates. I read all of your story. I will always read them hereafter. I go to Sunday-school at Tallman, two miles from here. I am going to school every day. We have only three days more of school. My father and mother belong to the Christian Church at Tallman.

There are lots of wintergreen berries here, and I am going to send you a box of them with this letter. There are lots of roots; and if you will write me, telling how many you want and how you want them fixed, I will send you some. I see by GLEANINGS you want some. I made about twenty dollars selling trailing arbutus. I like to sell them, they are so pretty. I tried to get some to send you, but they are all gone. I remember you, and your helping me sell berries. I write you because I want you to know I attend Sunday-school.

I will close for fear I shall take up too much of your valuable time. But I shall never forget Mr. A. I. Root, and I shall always keep that copy of GLEANINGS.

Walhalla, Mich., May 8. LOUIE BATES.

Well done, Louie. Now, if your father is a bee-keeper I can certainly afford to make your folks a call when I go up to my place next time; and if you and I together can't make wintergreens grow under cultivation, it will be funny. If you attend Sunday-school I shall not need to worry about your getting led astray by the saloon-keepers, shall I? And if you keep as honest and straight and *unselfish* as you were that morning in making change for your berries, I shall feel sure, too, that, when you grow up, you will not be one of the men who "want the whole earth." Now, remember, Louie, I am going to help you pick wintergreen berries some time, Providence permitting. From your old friend

A. I. ROOT.

Friend Root:—I see you want plants of wintergreen, so I send you some by express. They are such plants

as I set a year ago in a box filled with leaf mold, and mulched with moss, which has been kept well moistened. They are growing nicely. That is all I can tell you as to culture. I also include two small plants of *Hepatica* and two of trailing arbutus. I have heard it stated that the latter can not be transplanted successfully, but I have them growing finely in the same box with the wintergreen. The box was kept in the cellar during the winter. The local name for wintergreen here is "mountain tea." BURDETT HASSETT.

Reliance, Va., May 8.

Many thanks, friend H., not only for the plant (especially the trailing arbutus), but for the information you give that wintergreens can be grown under cultivation. We have got them planted outdoors in a rich sandy loam muched with moss as you direct.